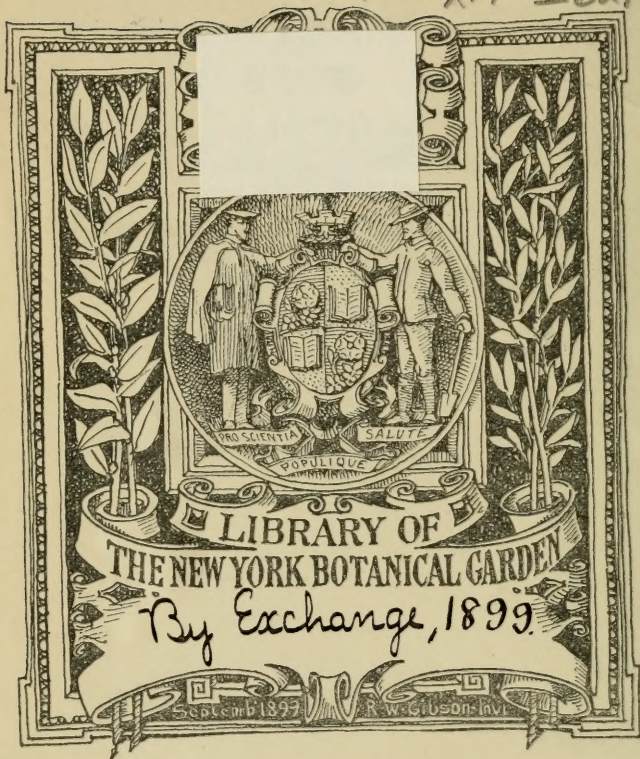


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ANNUAL REPORT
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY
For the Year 1884,

EMBRACING THE

Transactions of the Society from March 7, 1883, to March 1, 1884.

PROCEEDINGS, ESSAYS, DISCUSSIONS AND REPORTS.

Compiled and Edited by the Secretary, Oliver Gibbs Jr., Lake City, Minn.

MINNEAPOLIS:
JOHNSON, SMITH & HARRISON.
1884.



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LETTER OF TRANSMITTAL TO THE GOVERNOR.

SECRETARY'S OFFICE, }
LAKE CITY, Jan. 31st, 1884. }

Hon. L. F. Hubbard, Governor of Minnesota :

SIR : As required by the Act of the Legislature, session of 1883, I transmit to you herewith the annual report of this Society for the year 1884.

Trusting that our work as here indicated may meet with your approval and be commended to the Legislature as deserving of the confidence and support of the State government, I am,

Very respectfully, your obedient servant,

OLIVER GIBBS, Jr.,
Secretary.

OFFICERS AND MEMBERS FOR 1884.

PRESIDENT.

TRUMAN M. SMITH.....St. Paul

VICE-PRESIDENTS.

A. W. SIASRochester
F. G. GOULD.....Excelsior
A. H. REEDGlencoe
E. H. S. DART ..Owatonna
G. W. FULLER.....Litchfield

SECRETARY.

OLIVER GIBBS, Jr.Lake City

TREASURER.

J. T. GRIMESMinneapolis

EXECUTIVE COMMITTEE.

The President, Secretary and Treasurer *ex officio* and

J. M. UNDERWOOD.....Lake City
W. E. BRIMHALLSt. Paul
J. S. HARRISLa Crescent
R. J. MENDENHALLMinneapolis
C. L. SMITH.....Minneapolis

ENTOMOLOGIST.

R. J. MENDENHALL.....Minneapolis

LIBRARIAN.

E. H. CUZNER..... College of Agriculture, Minneapolis

COMMITTEE ON SEEDLING FRUITS.

J. M. UNDERWOOD	Lake City
A. W. SIAS.....	Rochester
J. S. HARRIS.....	La Crescent
M. PEARCE.....	Minneapolis
ANDREW PETERSON.....	Waconia

COMMITTEE ON NOMENCLATURE.

A. W. SIAS.....	Rochester
E. H. S. DARTT	Owatonna
WYMAN ELLIOT.....	Minneapolis

COMMITTEE ON FORESTRY.

S. M. EMERY	Lake City
COL. D. A. ROBERTSON.....	St. Paul
H. D. ELDRIDGE	Excelsior

COMMITTEE ON FRUIT BLOSSOMS.

GEORGE P. PEFFER.....	Pewaukee, Wis.
PROF. J. L. BUDD.....	Ames, Iowa
OLIVER GIBBS, Jr.	Lake City

COMMITTEE ON RUSSIAN APPLES.

PROF. J. L. BUDD.....	Ames, Iowa
A. G. TUTTLE.....	Baraboo, Wis.
F. G. GOULD.....	Excelsior

COMMITTEE ON GARDENING AND SMALL FRUITS.

C. L. SMITH	Minneapolis
KNIGHT WHIPPLE	Northome
WM. M'INTOSH	Langdon

COMMITTEE ON FLORICULTURE.

R. J. MENDENHALL	Minneapolis
WM. KING.....	St. Paul
MISS E. A. GILL.....	St. Paul

GENERAL FRUIT COMMITTEE.

SIDNEY CORP	Hammond
J. G. BASS.	St. Paul
D. K. MICHENOR	Etna
M. CUTLER.....	Sumter
WM. CANNON	Fort A. Lincoln, D.T.
G. W. FULLER.....	Litchfield
WM. McHENRY	St. Charles
Olmstead County Horticultural Society.....	Rochester
W. K. BATES	Stockton
L. E. DAY.....	Farmington
A. J. PHILLIPS	West Salem, Wis.
O. M. LORD.....	Minnesota City
B. TAYLOR	Forestville
S. H. KINNEY.....	Morristown
W. E. BRIMHALL	St. Paul
CHAS. LUDLUFF.....	Carver
CLARENCE WEDGE	Albert Lea
W. A. SPRINGER	Fremont, Wis.
E. MEYER.....	St. Peter

SUPERINTENDENTS EXPERIMENTAL STATIONS.

Prof. EDWARD D. PORTER,	University Farm, Minneapolis
PETER M. GIDEON.....	Excelsior
M. PEARCE.....	Northome
G. W. FULLER	Litchfield
A. W. SIAS	Rochester.
R. M. PROBSTFIELD.....	Moorhead
F. J. SCHREIBER.....	Moorhead
ANDREW PETERSON.....	Waconia
CHARLES LUDLUFF.....	Carver
UNDERWOOD & EMERY.....	Lake City
B. TAYLOR.....	Forestville
FRED von BAUMBACH.....	Alexandria
E. H. S. DARTT.....	Owatonna
L. E. DAY.....	Farmington
J. H. BROWN.....	Lac qui Parle
J. S. HARRIS.....	La Crescent

*The members of the General Fruit Committee are expected to report separately on all matters of interest in Horticulture, but more especially to bring to the notice of the society new and improved fruits.

ANNUAL MEMBERS, 1884.*

S. F. ALBERGER.....	Mankato
J. P. ANDREWS.....	Faribault
W. E. BIRMHALL.....	St. Paul
WALTER E. BIRMHALL.....	St. Paul
WM. HENRY BIRMHALL.....	St. Paul
HENRY F. BUSSEE.....	Minneapolis
W. J. BARRETT.....	Minneapolis
W. H. BARRON.....	La Crosse, Wis
DR. J. BENJAMIN.....	Hutchinson
E. V. W. BROKAN.....	Glencoe
J. F. BEASOM.....	Rice Lake
FRED BUSCH.....	Minneapolis
GEORGE BARR.....	Forestville
J. G. BASS.....	St. Paul
S. BATES.....	Stockton
M. C. BUNNELL.....	Newport
ETHAN CRANDALL.....	Sumter
SIDNEY CORP..	Hammond, Wabasha, Co
N. O. CRITTENDEN...	Dover
E. H. CUZNER.....	Minneapolis
M. CUTLER.....	Sumter
S. CUTLER.....	Excelsior
GEORGE W. CLARK.....	Winona
E. J. CLAUSSEN.....	Bismarek, D. T.
JOHN J. CASSIDY.....	Rochester
WM. CANNON.....	Fort Abraham Lincoln, D. T.
A. A. DIBBLE.....	Highmore, Hyde Co., D. T
S. G. A. DENNERLINE.....	Owatona
ALFRED A. DAY..	Farmington
L. E. DAY.....	Farmington
E. W. DANIELS.....	Auroraville, Wis
JOHN M. DURNAM,.....	Minneapolis
E. C. EATON.....	Lake City
H. D. ELDRIDGE.....	Excelsior
S. M. EMERY.....	Lake City
PHIL. EVERHARD.....	Mound Prairie
WM. FORSTER.....	Chatfield
MISS ANNA FORSTER.....	Chatfield
G. W. FULLER.....	Litchfield

PROF. S. H. FOLSOM.....	Minneapolis
E. P. C. FOWLER.....	Lake City
C. H. GREISE.....	Cleveland, Ohio
CHARLES GOULD.....	Lake City
W. GOLDEN.....	Plainview
J. F. GILMORE.....	Richfield
ISAAC GILPATRICK.....	Minneapolis
F. G. GOULD.....	Excelsior
MRS F. G. GOULD.....	Excelsior
GEORGE T. GIBBS.....	St. Paul
MRS. R. M. GIBBS.....	Lake City
J. T. GRIMES.....	Minneapolis
OLIVER GIBBS, JR.....	Lake City
W. G. HENDRICKSON.....	St. Paul
JOSEPH HAMMOND.....	Hammond, Wabasha, Co
DWIGHT HOPKINS.....	Morristown
P. N. HALE.....	Minneapolis
PROF. C. W. HALL.....	Minneapolis
FRANK I. HARRIS.....	La Crescent
E. E. HARRIS.....	La Crescent
J. F. HOSMER.....	La Crosse
Z. K. JEWETT.....	Sparta, Wis
W. C. KILVINGTON.....	Minneapolis
SETH H. KINNEY.....	Morristown
J. C. KRAMER.....	La Crescent
CHARLES LUDLUFF.....	Carver
GEORGE LABBITT.....	Lake City
A. W. LATHAM.....	Excelsior
WM. LYONS.....	Minneapolis
W. G. LE DUC.....	Hastings
DR. W. H. LEONARD.....	Minneapolis
O. M. LORD.....	Minnesota City
WM. McCRORY.....	Minneapolis
W. C. MESSMER.....	Lake City
L. D. MILLS.....	Garden City
W. McHENRY.....	St. Charles
D. K. MICHENOR.....	Etna
WM. McINTOSH.....	Langdon
R. J. MENDENHALL.....	Minneapolis
T. J. MEIGHEN.....	Forestville
E. NAGLE.....	Minneapolis
T. NELSON.....	St. Charles
J. NORQUIST.....	Red Wing
RICHARD PORTER.....	Huron, D. T.
ANDREW PETERSON.....	Waconia
JAMES W. POOL.....	Farmington

W. L. PARKER.....	Farmington
M. PEARCE.....	Minneapolis
EDWIN PICKETT.....	Carimonia
PROF. E. D. PORTER.....	Minneapolis
Z. ROBERTS.....	Bancroft, Iowa
A. H. REED.....	Glencoe
J. D. RINDERKNECHT.....	Chatfield
A. SHERMAN.....	Canton, D. T
C. L. SMITH.....	Minneapolis
BARNEY STEVENS.....	Farmington
MRS. L. E. P. SPRAGUE.....	Minneapolis
A. W. SIAS.....	Rochester
H. C. STEARNS.....	Minneapolis
CALEB SMITH.....	Farmington
W. W. SARGEANT.....	Minneapolis
MRS. H. B. SARGEANT.....	Lake City
JOHN TEACHOUT.....	Farmington
JOHN TURNBULL.....	La Crescent
THOMAS E. TRUSSELL.....	Champlin
B. TAYLOR.....	Forestville
J. M. UNDERWOOD.....	Lake City
MRS. J. M. UNDERWOOD.....	Lake City
CLARENCE WEDGE.....	Albert Lea
K. H. WHIPPLE.....	Northome
C. W. WARD.....	Sumpter
HIRAM WEBSTER.....	Lake City
B. K. WATSON.....	Minneapolis
G. S. WOOLSEY.....	Minneapolis
M. C. WHITE.....	Minneapolis
J. M. WELLES.....	Minneapolis
JAMES WRIGHT.....	Minnesota City
PHILO WOODRUFF.....	Faribault

*For names of members, 1883, who joined after Report of that year went to press, see appendix.

HONORARY MEMBERS FOR FIVE YEARS.

MISS HORTENSE SHARE, from 1880	Rosemount
MRS. L. E. P. SPRAGUE, from 1880	Minneapolis
MRS. ISAAC ATWATER, from 1880	Minneapolis
MRS. W. R. MURRAY, from 1881.....	Lake City
GEO. J. KELLOGG, from 1882.....	Janesville, Wis.
G. P. PUTNAM, from 1882	Ash Ridge, Wis.

HONORARY LIFE MEMBERS.

DR. JOHN A. WARDER (deceased)	North Bend, Ohio
DR. P. A. JEWELL (deceased).....	Lake City
LEONARD B. HODGES (deceased).....	St. Paul
PROF. J. L. BUDD ..	Ames, Iowa
HON. MARSHALL P. WILDER.....	Boston, Mass.
GEO. P. PEPPER.....	Pewaukee, Wis.
E. WILCOX.....	La Crosse, Wis.
J. C. PLUMB.....	Milton, Wis.
J. M. SMITH.....	Green Bay, Wis.
MRS. C. O. VANCLEVE.....	Minneapolis
MRS. WM. PAIST	Hersey
WYMAN ELLIOT.....	Minneapolis
R. J. MENDENHALL.....	Minneapolis
TRUMAN M. SMITH.....	St. Paul
L. M. FORD.....	St. Paul
M. PIERCE	Minneapolis
COL. J. H. STEVENS.....	Minneapolis
CHARLES HOAG	Minneapolis
J. T. GRIMES.....	Minneapolis
CHARLES Y. LACY	Fort Benton, M. T.
F. K. PHENIX.....	Delavan, Wis.
PETER M. GIDEON.....	Excelsior
MRS. WEALTHY GIDEON.....	Excelsior
MRS. JAMES BOWEN	Minneapolis
HON. NORMAN J. COLEMAN.....	St. Louis, Mo.
R. S. COTTRELL	Dover Center
A. W. SIAS.....	Rochester
MRS. IDA E. TILSON.....	West Salem, Wis.
MRS. H. B. SARGEANT.....	Lake City
MISS SARA MANNING.....	Lake City
D. W. HUMPHRY.....	Fariabault

HONORARY MEMBERS FOR 1884.

WILLIAM A. SPRINGER.....	Fremont, Wis.
S. BARTER	Markesan, Wis.
DR. T. H. HOSKINS.....	Newport, Vermont
HON. H. G. JOLY.....	Quebec, Canada
DR. F. G. HOUGH.....	Lowville, N. Y
J. E. WARD, St. Paul Globe.....	Minneapolis
C. A. COOK, St. Paul Pioneer Press.....	Minneapolis
MISS C. J. BARTLETT, Daily Tribune.....	Minneapolis
L. B. LITTLE, Daily Tribune,.....	Minneapolis
W. VAN NORMAN, Evening Journal.....	Minneapolis

MINNESOTA STATE HORTICULTURAL SOCIETY

SUMMER MEETING, 1884.

PROGRAM.

FIRST DAY, WEDNESDAY, JUNE 27.

ENTRIES FROM 9. A. M. TO 2 P. M.

2 p. m.—Opening exercises, Addresses, Volunteer papers, Question Box and Discussions.

Appointment of judges on premiums.

SECOND DAY, THURSDAY, JUNE 28.

The exhibition will open at 9 a. m., and judges will please hand their awards to the Secretary at 12 m.

The meeting will be informal and social, and at 12 m. the exhibitors, members and invited guests will confiscate the entire display of fruits for the purposes of a basket picnic dinner.

2 p. m.—Announcement and payment of premiums.

Addresses, Question Box, Volunteer papers and discussions, general business and final adjournment

The Annual Report for 1884 will be ready for distribution at the meeting.

OLIVER GIBBS, JR.,
Secretary.

J. S. HARRIS,
President.

PREMIUM LIST.

PROF. EDWARD D. PORTER, Superintendent of Exhibits.

STRAWBERRIES.

Best display, not less than six varieties. 1st premium, \$5; 2d, \$4; 3d, \$3
4th, \$2.

Best variety for general market, \$3.

Best variety for home use, perfect in flower, \$3.

Best three plants in bearing, grown in pots, \$3; 2d, \$2.

	1st Prem.	2d Prem.
Best quart Wilson's Albany.....	\$1.00	.50
Best quart Charles Downing	1.00	.50
Best quart Downer's Prolific.....	1.00	.50
Best quart Green's Prolific.....	1.00	.50
Best quart Crescent Seedling.....	1.00	.50
Best quart Captain Jack.....	1.00	.50
Best quart Cumberland Triumph.....	1.00	.50
Best quart Miner's Great Prolific	1.00	.50
Best quart Red Jacket.....	1.00	.50
Best quart Pioneer.....	1.00	.50
Best quart Glendale... ..	1.00	.50
Best quart Endicott No. 2.....	1.00	.50
Best quart Downer.....	1.00	.50
Best quart Sharpless.....	1.00	.50
Best quart Manchester	1.00	.50
Best quart Bidwell.....	1.00	.50
Best quart Minnetonka Chief.....	1.00	.50
Best quart Iowa Prolific.....	1.00	.50
Best quart Hart's Minnesota Seedling	1.00	.50
Best quart Kentucky.....	1.00	.50
Best quart Windsor Chief.....	1.00	.50
Best quart Boyden.....	1.00	.50
Best quart variety not herein named.....	1.00	.50

SPECIAL PREMIUM.

Offered by Wyman Elliot, Minneapolis.

Best Seedling Strawberry, not before exhibited, \$6; 2d, \$4.

CHERRIES.

Best quart Early Richmond	\$2.00	\$1.00
Best quart any other variety.....	2.00	1.00

Strawberries and Cherries will be displayed on tea plates to be furnished by the Society.

PLANTS AND FLOWERS.

	1st Prem.	2d Prem.
Best display of greenhouse plants.....	\$10.00	\$5.00
Best display of roses in pots.....	2.00	1.00
Best display of fuchsias.....	2.00	1.00
Best display of geraniums.....	2.00	1.00
Best floral design in cut flowers.....	2.00	1.00
Best basket cut flowers.....	2.00	1.00
Best hand bouquet cut flowers..	2.00	1.00
Best bouquet of roses.....	2.00	1.00

VEGETABLES.

Best display.....	\$5.00	\$3.00
Best half peck green peas.....	1.00	.50
Best half peck string beans.....	1.00	.50
Best six bunches of onions.....	1.00	.50
Best six bunches of beets.....	1.00	.50
Best six bunches of radishes.....	1.00	.50
Best six bunches carrots... ..	1.00	.50
Best six bunches turnips.....	1.00	.50
Best six bunches asparagus.....	1.00	.50
Best three heads cabbage.....	1.00	.50
Best three heads cauliflowers.....	1.00	.50
Best three heads lettuce.....	1.00	.50
Best six stalks pie plant.....	1.00	.50

The exhibition is open in all departments to growers in Minnesota, Wisconsin, Dakota and Northern Iowa,

M. PEARCE,
WYMAN ELLIOT,
J. T. GRIMES,
Committee of Arrangements.
Minneapolis, Minn.

The society met at the College of Agriculture, University of Minnesota, at Minneapolis, Wednesday, June 27th, 1883, and was called to order at four o'clock in the afternoon by President Harris, who read the following address :

PRESIDENT'S ADDRESS.

Members and Friends of the Minnesota State Horticultural Society :

We meet again in these familiar halls for a season of rest and recreation, and to make another page in the book of horticulture; to exchange friendly greetings, and to tell one another of our successes and failures, and to receive and impart information that shall make us happier in the pursuit of our avocation, and more useful citizens of Minnesota. The queen of fruits, the gay beautiful queen, has spread a feast and decked the tables with garlands, and we are the invited guests. We come from near and far, and have left business and care at home, and she bids us have a good time. As she is the first dowered daughter of Pomona, it is well that we are disposed to win her smiles by devoting to her much of our attention. Sweet Flora has also secured a place of honor in this feast, and although she may blush to hear our open praise of her beauty, she will not withdraw her smiles or withhold her sweetness when we do homage to the queen. We meet under auspicious circumstances, and we have reasons for congratulation upon the progress that horticulture is making in this state, and for rejoicing that a benificent Providence has smiled upon all our broad domain and given us a seed time, and a bountiful harvest is now at our very doors. The floods and the winds that strike terror to the heart and leave ruin and death in their track have passed us by and health and prosperity are our lot. Our Society is in a flourishing condition; is entirely out of debt, except a debt of gratitude to those true friends who had faith in us, and rendered us assistance in our day of small things, and we have a larger membership than at any previous time. I have heard only good reports of the late annual meeting held in this place, and it has universally been pronounced the best one

yet held, and has resulted in a volume of transactions that, I believe, will when placed in the hands of our farmers and horticulturists soon add many times its cost to their wealth and prosperity. It was a meeting that I had looked forward to with much pleasure, but was prevented in attending by a summons to the bedside of my aged mother who died soon after. The last winter was one of unusual severity, but not so disastrous to our fruits as we had feared, and no doubt we may attribute the survival of many of our trees and plants to the depth of snow that covered the ground. As it is, it has been a test winter, and is a reminder that our pomology is in need of further development.

At the annual meeting it was voted to establish a number of experimental stations where the new seedlings or any varieties seeking public favor, shall be put upon a test trial in a systematic way to bring out their merits, and to be reported upon to the society at its annual meetings. In accordance with this the executive committee have held a meeting and designated the following places and persons for the purpose, viz :

Station No. 1, Minneapolis, E. D. Porter and M. Pearce; No. 2, Lake City, Underwood and Emery; No. 3, La Crescent, J. S. Harris; No. 4, Rochester, A. W. Sias; No. 5, Faribault, O. F. Brand; No. 6, Fergus Falls, Jacob Austin; No. 7, Moorehead, R. M. Probstfield. I presume that every gentleman at the head of these stations has facilities for giving the proper tests to all varieties that may be sent to them, and will enter promptly upon the work whenever buds and scions are furnished them. This system if fully carried out, will subject the candidates to a very thorough test, and quickly demonstrate which are not adapted to the more unfavored localities, and do away with much of the uncertainty that always follows the introduction of a new variety, and in a great measure protect our members from the swindling so frequently practiced by foreign tree venders, as the fruit will be pretty well known and also the parties having it in stock, through the reports made by the managers of these stations. But I would not have you understand that these stations are to take the place of or do away with individual effort in the same direction. They are designed to hasten and facilitate the work. If every farmer, nurseryman and gardener in the state were to immediately set about the work of originating a good, long keeping variety, perfectly adapted to every part of the country, and if one or a dozen of them should succeed, if done outside of this organization, it could hardly be hoped that less than 10 years would elapse before it became known and tested

and another ten before it had been propagated, placed in the hands of the people and yield fruits in paying quantities, that will meet all demands. Therefore it is important that the experiment be started without delay, and pushed forward by every appliance that can be afforded by science and organization, or before the good time comes, this generation will have passed away, and their children's children will have their teeth "set on edge" by the sour crab. It is expedient also to make the most of the varieties that are already originated by looking them up as speedily as possible, and give this generation a tree before they are gathered to their fathers. I am glad to note that the interest in the growing of seedling fruits is on the increase, and some of the reports received are encouraging. There is one other matter to which I wish to call your attention at this time, the 19th session of the American Pomological Society is to be held in the city of Philadelphia, commencing Wednesday, the 12th day of September, next.

All Horticultural, Pomological, Agricultural, and other kindred associations in the United States and British Provinces, are invited to send delegations, and all persons interested in the cultivation of fruits are invited to be present and take seats in the convention. Nearly every State in the Union will be represented in the meeting, and most of them will doubtless make creditable displays of their fruits. With this end in view we made an effort last winter to secure from our legislature an appropriation of \$500, to defray the expense of two delegates and a display of fruits, but failed to secure it. Many thousands of dollars of money was appropriated to purposes that, in the end, may prove of less importance than this, yet I do not feel that we should censure our Hon. Legislature, but rather blame ourselves for not moving sooner and educating our worthy members up to the standard of the age. While it would be a rare treat for any of our members to meet with so many distinguished horticulturists, there are but few of them in such financial circumstances that they can afford the time or expense of going so great a distance. Please to give the matter your consideration, and if you deem it advisable and we cannot send delegates, make sure arrangements for a small exhibit of our choicest fruit. If you deem it expedient to do so, it will become necessary to create a committee to make and forward the collection of fruit and also to provide for the expense of shipping the same. I am of the opinion that under the act of the Legislature passed February 27th last and duly signed by the Governor, re-organizing the State Agricultural Society, and appropriating moneys to aid county and certain other

societies, we are entitled to an additional sum of \$100, or more, as soon as we comply with the provisions of the act. We are holding annual fairs in connection with our summer meetings and paying premiums in excess of the amount required by law, and that too, upon articles that cannot be exhibited at the season when the state fairs are held. I would recommend the appointment of a committee to investigate the matter, and if such moneys are due us we could devote a like sum to the offering of special premiums at the state or other fairs where our society has the privilege of competing for premiums.

The sad duty devolves upon me of announcing the decease of two active and esteemed members of our society.

The Hon. Leonard Bacon Hodges, the great Arboriculturist of Minnesota, and late Secretary of the State Forestry Association, and James Bowen, our late librarian, are dead. Mr. Hodges died at his residence, 408 Laurel avenue, St. Paul, about 8 o'clock p. m., Saturday, April 14th from a complication of diseases having their origin in an enfeebled condition of the digestive organs. He was born at West Bloomfield, Ontario county, N. Y., on the 15th day of July, 1823. His ancestors came from England early in the history of the colonies, and were distinguished for their patriotism and unselfish devotion to the institutions of this country. In the biographical sketch of this useful man which appeared in the Pioneer Press of April 16th, we find that he left his home and set out to face the world at the age of thirteen years. He first found employment at New Haven, Conn., as a clerk in a book store. Afterwards he entered the English department of the Seminary at Andover, Mass., for the purpose of perfecting his knowledge of the science of surveying and adding to his stock of general knowledge, and after leaving the Seminary he spent three or four years at surveying, teaching and farming in the state of New York. He came to Rockford, Ill., in 1845 and purchased a farm, but did not remain there long. From there he went to Wisconsin, and after engaging in various pursuits he proceeded to Alamakee county, Iowa, and was United States deputy surveyor, did considerable work in that state and the adjoining Northwest, and thus became familiar with the aspect and wants of this country and fitted to enter with zeal upon a course that would hasten its development. In 1854 he came into this state and began work upon a farm and was the founder of the town of Oronoco, and in 1870 he was nominated and elected to a seat in the senate of our legislature, upon an antimopoly platform. He settled in St. Paul in 1872, where he con-

tinued to reside up to the time of his death. He became a member of the State Horticultural Society at the annual meeting, Jan. 20, 1875, and at that meeting contributed an able paper on forest culture on the St. P. & P. R. R. and a portion of the country tributary thereto. He has since continued a member of the society and contributed several able and instructive papers, the last of which is contained in the volume of transactions just published. He was founder of the State Forestry Association which was organized in 1876, and its master spirit and Secretary up to Jan. last. He also prepared the original draft of the timber culture act, which is proving of such great benefit to the settlers upon our prairies, and was also author of "The Manual of Tree Planting." As a writer, he was practical; as a speaker, fearless, positive and convincing. He more than any other man of this or past generations has opened the way for dotting our prairies with groves and forests, and also opened the way for practical and safe fruit culture by his perseverance in advocating the work and the successful conducting of experiments whereby he changed public opinion and proved that "trees if properly planted can be made to grow where nature has failed to provide them," and in so doing has built his own monument in the heart of every member of this Society, and his name will yet be canonized on ten thousand hearth stones in this State, and we can point with sincere pride to his earnest and useful life, and the courage that never failed him as an inspiring example to ourselves and to those who are to come after us.

I recommend the adoption of the following resolutions as a tribute to his memory :

In Memoriam.

LEONARD B. HODGES.

1st. *Resolved*, That in the death of Leonard Bacon Hodges, Minnesota has lost her foremost leader and pioneer in forestry, and this society one of its most able, earnest and intelligent members.

Resolved, That we contemplate with admiration his successful career in this state as an advocate and planter of forest trees along the lines of railroads and upon our treeless prairies, and his perseverance in advocating the work and conducting experiments whereby he has changed public opinion, and proved that our most bleak prairies can be so ameliorated as to become a pleasant and desirable abode for man, and that with sincere pride we point to his earnest and unselfish life and the courage that never failed him as

an inspiring example to ourselves and to those who are to come after us.

My acquaintance with Mr. Hodges was slight, but slight as it was I had learned to esteem him very highly and hope that another pen may put upon record a fitting memoriam.

The following judges were appointed to award the premiums :

On Fruits.—Wyman Elliot, J. T. Grimes, Peter M. Gideon.

On Plants and Flowers.—Mrs. L. E. P. Sprague, Mrs. J. M. Welles, Mrs. Wealthy Gideon.

On Vegetables.—Col. John H. Stevens, Ditus Day and A. J. Phillips.

Col. Stevens called attention to the approaching meeting of the American Forestry Congress, at St. Paul, and suggested that some action be taken regarding it ; and on motion, he was requested to draft and present a suitable resolution for adoption, extending a hearty welcome to the congress.

The day being too far advanced to take up the regular business, the remainder of the session was devoted to discussion on the potato, suggested by the following from the

QUESTION BOX.

Which are the two earliest varieties of potatoes best suited to Minnesota ?

Wyman Elliot. The two best varieties in general cultivation are Beauty of Hebron and Early Ohio. What two are really the best is perhaps a matter of experiment with the newer kinds.

President Harris. The best single early sort is the Beauty of Hebron.

Mr. Elliot. The Early Ohio requires sandy soil. In clay or any heavy soil it is not so good. Clark's No. 1 is an A No. 1 potato. It is not nearly so early as the Hebron. It is an immense yielder on sandy clay loam.

The Secretary. I planted the Gideon Seedling and the Beauty of Hebron the same day last year, and the Gideon gave me the market for nine days, at Lake city, before any other potato got in. The objection to it is that it closely resembles the Early Rose and scabs badly ; although the Early Ohio on my grounds takes the blight and the scab the worst of anything.

A vote being taken, the experience of the majority present was declared in favor of the Beauty of Hebron and the Early Ohio.

SECOND DAY.

A. J. Phillips, of West Salem, and E. G. Partridge, of Warren, St. Croix county, presented credentials as delegates from the State Horticultural Society of Wisconsin, and were welcomed accordingly.

STRAWBERRIES AND THEIR CULTURE.

Mr. Pearce. For the purpose of opening the discussion on this subject I will ask what is the proper time of setting strawberry plants?

Peter M. Gideon. In the spring, as soon as the frost is out of the ground and the soil in proper condition to work. If the plants are vigorous and well set they will bear a crop the same season.

Mr. Pearce. I set last year the first of June. Removed all the buds and blossoms. Used a paddle, and set the roots straight down, never had plants grow better. This year, I set the tenth of June two and one half acres, and never lost a plant. There is more vigor then in the plants to start the new growth that is necessary immediately after the setting.

Mr. Gideon. I use a dibble or spade, and spread the roots in fan shape.

Mr. Elliot. The best time is just after the plants have made new leaves. Always pinch off the buds and runners before planting. Never set from old spent beds, as the plants will be neither pure nor vigorous. Dig with a fork and save all the roots possible. Never put any earth on the crown in setting. Be careful to have the ground well packed or firmed around the plants when set. Neglect of this is the cause of the most of the failures, as then the loose

surface lets in the dry air upon the fibrous roots and kills them before they begin to absorb moisture for themselves. Cultivate deep and thoroughly the first year.

Prof. Edward D. Porter. The main thing is to have the right conditions of the soil, the plant, and the weather. Then I would risk planting in any month when the plants were growing. According to our experience here I would say the best time to plant is usually the last week in May or the first in June. Mr. Elliot states the most important point when he advises careful firming of the soil around the plant. In eastern fields the men are instructed to set the foot on each plant. The pressure of the hollow of the foot on the crown of the plant does the firming.

President Harris. I agree with Professor Porter, but think the last of May is generally preferable. I make a practice always to firm by putting my foot on the plant, and sometimes wish I weighed more. It is difficult to make hired men do this properly, as they are afraid of hurting the plants. The ground must be in high tilth, and every way in good order to grow strawberries to advantage. I believe the old style of leaving all the roots on is best. Fall setting does fairly well with me. Say in October. August is unfavorable on account of drouth.

Fred Busch. I have a number of kinds, but the Wilson takes the lead as yet. Crescents bear well, but the second year of Wilsons is equally as good as the first. My soil is the common loam with clay subsoil. Late set Wilsons do not bear well. The Crescent being pistillate must be fertilized by staminate sorts or it will not bear. The Countess [Downer's Prolific], bears about as much fruit as any of them on sandy soils, but does not do so well with me. I think the Glendale is a nice berry. It is late. These with Wilsons and Crescents are best on my soil.

Prof. Porter. The Crescents and Wilsons are the favorite market sorts East.

Mr. Gideon. Of all that we have tried we prefer the Green Prolific and Crescent. For a fertilizer we use the Downer's Prolific or Charles Downing. These mix well.

Mr. Pearce. For all soils I think nothing gives such general satisfaction as the Crescents, for home use. For a fertilizer I use the Glendale. For a farmer's berry I would recommend the Pioneer.

Mr. Partridge. I have used the Wilson and Kentucky to fertilize the Crescent. The Wilson for early pollen, the Kentucky for the later blossoms.

The Secretary. Mr. Partridge here brings up an important point that should be fixed in our minds; the necessity of extending the pollen to the latest blossoms as well as giving it to the earlier ones of the pistillates. Inattention to this is probably the cause of so many small inferior berries from the late blossoms in many cases. The idea of having two staminate kinds to do it, an early and a late one, is new and valuable.

F. G. Gould. The best berry for the farmer is the best one for everybody else. The question of profit is the main question. So far as my knowledge goes, I see but little difference in quality of different sorts. Have been growing strawberries ten to fifteen years. I got the Wilson, first, and on the whole they do the best on my grounds. They fertilise themselves. The yield is great, and the berries are large, and can be shipped to distant points, and come out sound. I think it wrong to place Crescents ahead of Wilsons. The first crop of Crescents may be heavier, but after that inferior.

Mr. Elliot. The Wilson is a shy grower, unless it has good cultivation the first part of the season. The Crescent and Downers or Countess are rank growers and get ready for a full crop the first year. If growers on sandy soils will manure and cultivate well they will have no trouble to make it bear a good crop.

In reply to a question from Col. Stevens: I wish to correct my record as to the identity of the Countess and the Downer's prolific. I think they are the same.

Mr. Gideon. For the farmer we want the best flavored berry that is productive, and for this reason I hold that the Wilson is not the one. It is profitable for the grower for market, the gardener; but the Green Prolific is of a more delicious flavor and productive if well fertilized.

W. J. Abernethy. I have fifteen varieties. My soil is clay with some sand and fertile. I covered my Wilson's last fall with manure. This spring raked it off, and now have as heavy a crop as I ever saw anywhere of any variety. Crescents treated the same way, and now bearing heavily, this being the third year. Charles Downing appears not to be a free bearer. Perhaps it requires more age. Duchess and Sharpless entire failures. Hart's Seedling not successful. Some large berries, but stems short and fruit down in the ground. Kentucky does well. The best for flavor is the Cumberland Triumph though not a great bearer. Champion late and nice. Jersey Queen is late. I am surprised to see how few varieties have good blossoms for fertili-

zing. Wilson is the best of all in this respect. Am much pleased with the Bidwells so far. Mine are full, and the berries very large. Glendales show a blight or burning of the leaves.

Mr. Busch. Is the Jersey Queen a good bearer?

Mr. Abernethy. With me it bears quite well.

The President. Is the Cumberland Triumph perfect in flower?

Mr. Abernethy. Very fair in this respect.

Mr. Phillips. I have berries here of the Bidwell variety grown by John Van Loon, of New Amsterdam, Wisconsin, picked two days ago, June 25. They were exhibited at our La Crosse meeting that day, stood at the Minneapolis depot all day yesterday, and are still in good condition. Mr. Van Loon says he never had any vines on his grounds, so heavily loaded with berries as these Bidwells are.

The President. In years past, I have said a good deal against the Green Prolific. One reason was I did not know it needed a fertilizer. It was a wise thing done when this society enlisted such a man as George P. Peffer, of Wisconsin, to instruct us in regard to blossoms of fruit, plants and trees, and now I am satisfied that the Green Prolific is a good variety if well-fertilized by staminate grown near by. The Wilson is good in flavor, if well ripened. We must not give up experiments, but let us stand by the well tried sorts.

Mr. Gould. I have noticed that a well-established Wilson sends up from two to four well-loaded stems of fruit, while Crescents are apt to have only one stem and many small berries. There is a new candidate in the field—the James Vick. It seems to give better promise than any new variety I have seen. I have not fruited it yet, but from its appearance as a plant and from what I have read and heard of it, I prophecy this variety has come to stay.

Mr. Gideon. A rich black loam will not produce as many Wilsons as a clay soil. The Crescent will beat the Wilson on the loam two to one.

Mr. Fawcett. There is an adaptation of varieties to particular soils to be considered, and no rules can be laid down as to the best varieties without careful reference to this fact. Many varieties are very particular in regard to their soils, and others seem to do well on all soils.

Mr. Busch. Many persons think they have the Wilson when the plants are something else.

Mr. Gideon. Old patches always have more or less seedlings. My Crescents when I got them were pure, but I noticed last year I

couldn't go two feet without finding seedlings. In the course of time these seedlings get full possession, and being sent out for new plantings are called Crescents; and it is so with the Wilsons.

George S. Woolsey. I raised Wilsons for ten or fifteen years, and they nearly all ran out.

On a ballot for choice of varieties they were arranged in the following order :

- 1st. Wilson.
- 2d. Crescent.
- 3d. Downer's Prolific.
- 4th. Charles Downing.
- 5th. Green Prolific.
- 6th. Captain Jack.
- 7th. Pioneer.
- 8th. Hart's Seedling.

In Memoriam.

JAMES BOWEN.

Resolutions of respect to the memory of James Bowen having been introduced by A. J. Phillips and W. J. Abernethy, were, on motion, incorporated as one as follows, and adopted as the sense of the society, and the secretary instructed to transmit a copy to Mrs. Bowen :

Whereas, James Bowen, librarian of this society, and instructor in Horticulture at the State University, has gone from our midst since our last meeting, into the great change which we are accustomed to call death, therefore

Resolved, That we here express our sincere appreciation of his worth when we say that in his loss we give up a useful and valued member of the State Horticultural Society, and that in his long experience in his chosen field, of horticulture and floriculture, and his ability to impart instruction to others, united with his kindness and consideration for the wants of all with whom he came in contact, he was eminently fitted for the responsible station which he occupied.

Resolved, That this society extend its sympathy to the wife and children of the deceased, and that as a mark of respect to them and to his memory it order these resolutions placed on the records of the society, and printed in its annual report.

On motion the secretary was instructed to draw an order in favor of Mrs. Bowen, for ten dollars, for her late husband's services as librarian.

Mr. Phillips. Before this passes out of the order of business, I desire to say that there are circumstances connected with the death of our friend Bowen, that in a peculiar manner are calculated to enlist our sympathies with him and his wife and dependent family. Misfortune has fallen heavily upon them. Since our last meeting two of their children were horribly frightened by a tramp — one of them so as to cause its death — the other so as to lose for life its sense of hearing. They have also buried two other of their children, twins, within the same period, and now the husband and father has been snatched away. James Bowen was a man who had in a brief time since the society has met here at the College of Agriculture, endeared himself to all our hearts. None of us will forget how laboriously, yet cheerfully, he worked at our last winter meeting to make our sessions here pleasant and profitable. While we hold him in grateful remembrance let us not forget to aid to any extent in our power the widow and the fatherless whom he has left for our care.

On motion Mrs. Bowen was declared an honorary life member of this society, and the secretary instructed to notify her of the same.

AMERICAN POMOLOGICAL SOCIETY.

Prof. Porter. At the winter meeting last January, the society did me the honor to recommend to the executive committee my appointment as delegate to the meeting of the American Pomological Society to be held at Philadelphia, September 12th. It is expected, as I understand the matter, that an exhibition of the fruits of our state is to be made there; and I wish to say to the society that while I can and will gladly if required attend to the transportation and display of the fruits, it will be necessary to confide the collection of them to other hands, as my time and duties will not make it possible for me to attend to that.

Col. Stevens moved that the president and secretary be authorized to get the fruits together and pack them for transportation; and they declining, Wyman Elliot, Mr. Lowell and M. C. Bunnell were suggested, and after various motions and remarks on the subject the whole matter was laid over for the action of the executive committee.

INVITATION TO DINNER NEXT YEAR.

Prof. Porter. As the society is aware we are fitting up the new University farm out on the Como road, a three miles ride from here. A year from now our buildings will be completed and the grounds cleared and put partially in order to receive company, and as the College of Agriculture, to say nothing of the University itself, has a warm side for the State Horticultural Society, I desire to invite you all to come out and dine with me on the occasion of your assembling for your summer meeting in the year 1884.

On motion the invitation of Prof. Porter was accepted, with the understanding that the usual ceremony of confiscating the strawberries on exhibition to the common use of members and guests may be done at the farm.

Recess till 2 p. m.

AFTERNOON SESSION.

The judges having returned their awards, the list of entries and premiums was read, as follows :

STRAWBERRIES.

Wilson. Oliver Gibbs, Jr., first premium on single quart, on best variety for home use and on best variety for general market. W. E. Brimhall, second premium on single quart. Other entries were by John F. Gilmore, Underwood & Emery, Henry F. Bussee and J. S. Harris.

Charles Downing. J. S. Harris, first premium.

Downer's Prolific. Underwood & Emery, first premium.

Crescent. Henry F. Bussee, first premium ; William Lyon, second premium. Other entries by Oliver Gibbs, Jr. and M. Pearce.

Captain Jack. W. E. Brimhall, first premium.

Pioneer. M. Pearce, first premium ; John F. Gilmore, second premium.

Glendale. George W. Woolsey, first premium ; J. C. Kramer, second premium. Other entry by William Lyon.

Countess. William Lyon, first premium.

Sharpless. Underwood & Emery, first premium.

Bidwell. John Van Loon, first premium.

Minnetonka Chief. George W. Woolsey, first premium.

Harts' Minnesota Seedling. W. E. Brimhall, first premium.

Windsor Chief. William Lyon, first premium.

Boyden. Underwood & Emery, first premium.

Duncan. William Lyon, first premium ; M. Pearce, second premium. Other entry by John F. Gilmore.

New seedling strawberry never before exhibited. N. Hintgen, first premium ; J. C. Kramer, second premium.

PLANTS AND FLOWERS.

Floral Design. Underwood & Emery, first premium.

Basket Cut Flowers. Underwood & Emery, first premium.

Hand Bouquet. Underwood & Emery, first premium.

Display of Pansies. George W. Woolsey, first premium ; Underwood & Emery, second premium.

Basket Cut Flowers. Mrs. W. G. Hendrickson, first premium.

VEGETABLES.

Asparagus. J. T. Grimes, first premium ; J. C. Kramer, second premium. Other entries by W. E. Brimhall and Frank Abernethy.

Lettuce. J. S. Gray, first premium ; W. E. Brimhall, second premium.

Pie Plant. Frank Abernethy, first premium ; J. S. Harris, second premium.

Cauliflower. Fred Busch, first premium.

The premiums were then certified to the treasurer and paid.

GENERAL BUSINESS.

HONORS TO MRS. GIDEON.

The Secretary. Mr. President and fellow members: The readers of our reports have found scattered along our pages frequent mention of a seedling apple called the Wealthy. It has been and will be in the future, very prominent in the history of fruit in the United States. Last winter we elected its originator, Mr. Peter M. Gideon, an honorary life member of this society, and as we now have with us the "original Wealthy," so far as the name of the apple is concerned, Mrs. Wealthy Gideon, I move that this lady be also declared an honorary life member of our society.

The motion being seconded was submitted to a vote and carried unanimously.

Mr. Gideon. On behalf of Mrs. Gideon and at her request, I return you our hearty thanks for the honor you have conferred.

AMERICAN FORESTRY CONGRESS.

Col. Stevens reported the following resolution :

Resolved by the Minnesota State Horticultural Society, in convention assembled :

That the Society is grateful to the American Forestry Congress for the compliment of the selection of the City of St. Paul, the capital of our State, for holding their annual meeting for the year 1883, and that the members of the Society are requested to forward the interest in every possible manner of the said congress during their deliberations, and extend a welcome hand to each and every member of that distinguished body.

Resolved, That this Society would most respectfully urge upon our agriculturists and horticulturists, the importance of attending the session of the American Forestry Congress at St. Paul, being fully convinced that there is no one matter fraught with more moment to the present and future generations of our north-west than the agitation of forest culture.

The resolution was adopted.

APPROPRIATIONS AND BILLS ALLOWED.

On motion there was appropriated to the Secretary \$75 for postage in sending out reports and \$25 for office expenses, to be accounted for at the annual meeting; also to President Harris, \$7 for expenses, and the following bills were ordered paid:

Johnson, Smith & Harrison, \$2 for letter heads for use of the President.

H. B. McKenny, \$13.50, printing programs and letter heads for the Secretary.

LIBRARIAN.]

E. H. Cuzner was announced as Librarian for the Society in place of James Bowen, deceased.

QUESTION BOX.

What is the cause of apples falling from the trees soon after setting?

Prof. Porter. Deficient vitality in the tree, from various causes, unfavorable seasons, storms, etc., the tree setting more fruit than the branches or buds can nourish.

Mr. Gideon. Fruit often fails from hard beating rains while in the bloom.

Prof. Porter. The germ is formed the preceding year, but the fertilization which produces development occurs after the blossoms are opened in the spring, and storms may then blight or impair the vigor of the pollen.

What is the prospect for the fruit crop the present year in Minnesota?

Mr. Gideon. Apples injured in blossoms by driving rain. Small fruits never better.

President Harris. Strawberries a fair crop, but season will be short. Apples in the river district where I live only a fair crop. At Rochester the prospect seems to be good for all fruits.

Prof. Porter. I would like to ask Mr. Phillips how the Whitney No. 20 stood the winter?

Mr. Phillips. All sound to the terminal bud, except some that were broken down by snow drifts. If a man cannot grow the Duchess and the Whitney No. 20, I would not advise him to set anything. Trees that last year bore a heavy crop of winter apples, went into the winter in an exhausted condition, and showed signs of weakness early this spring, but will mostly recover. Duchess and others that matured their fruit early, went in strong and have come out strong.

SECKEL PEAR.

The Secretary. I am interested in a small experiment with Seckel Pear grafted on Whitney No. 20 and Beecher Sweet, as this is said in Western New York to be the only pear that is a permanent success on the apple. My cions were grafted last spring. They took vigorously and are growing well. I will report them hereafter.

STATE ORCHARD.

Mr. Gideon, in reply to a question by Prof. Porter. The trees in the State Orchard were not permanently injured by the hail storm last spring.

WHITNEY NO. 20.

Mr. Phillips. I will repeat what I have before recommended about the Whitney No. 20. Set them out along roadsides and

farm lines for posts to use in wire fencing, and for ornament and fruit. They are as straight and regular as any fence post, and you can trim them high.

Mr. Pearce. I grafted Whitney five years ago. Have some 600 in orchard. A great many people come to me for ornamental trees, and I give them the Whitney. Its form is upright, regular, and they all have an expression of their own as distinct from any other tree as the Lombardy Poplar. I have never seen any blight on them.

Mr. Phillips. I have seen the old original Whitney No. 20, at A. R. Whitney's Franklin Grove, Illinois, when it had six bushels of apples on it.

M. C. Bunnell. Out of a bill of 125 trees I sold last year in Dakota county, 75 per cent. were badly discolored this spring; but a lot of Whitneys among them looked best of all.

PROTECTION.

Prof. Porter. I saw an orchard last spring, of 16 years growth, protected by belts of evergreens set in alternating rows, and the owner said the effect was disastrous from unequal temperature. This man would now select the bleakest site on the farm for his orchard.

President Harris called attention to the approaching fall fairs, state, district and county, and urged upon members of the society the importance of attending and giving them all the aid in their power in the exhibition of horticultural products.

Discussions of other interesting topics occupied further time during the afternoon, but were not preserved for the report owing to the absence of a reporter, the secretary being engaged in closing up the business of the session, relating to premiums, and distribution of books to members.

The meeting was a pleasant one, and on the second day largely attended, but not as successful in the fruit exhibits as formerly, owing to the anomalous character of the season, and the difficulty of fixing upon the date in advance to hit the ripening of the strawberries, in different parts of the state, to the best advantage.

PREMIUMS AWARDED AND PAID.

On Strawberries.....	\$23.00
On Plants and Flowers.....	10.00
On Vegetables.....	5.50
	----- \$38.50

MEETING OF THE EXECUTIVE COMMITTEE.

The Executive Committee met at the Senate Chamber, State Capitol, St. Paul, at eleven o'clock, a. m., August 8th, 1883, upon the call of the chairman.

Present, J. M. Underwood, chairman ; and Messrs. Gould, Grimes, Brimhall, Brand, and the Secretary, President Harris being absent from the state.

The Chairman. I have called the committee together to decide what action is best to be taken in regard to sending a collection of our fruits to the meeting of the American Pomological Society, to be held at Philadelphia, September 12th. It was the understanding last winter that Prof. Porter would serve as our delegate, but he cannot attend to the collection and shipping of the fruit ; and although various suggestions were made to cover this point at the summer meeting in June, nothing decisive was hit upon, and it is not known that any one feels specially charged with this duty or is authorized to incur the necessary expense. The committee at their meeting in St. Paul, in February, made an estimate of \$400 as the outside figure of all expenses connected with the sending of a delegate, the collection and exhibition of fruit, &c. The question is now, what action shall we take in the premises, as it appears to rest entirely with this committee.

Mr. Grimes. It appears to me the first question in order is, have we got such a crop of fruit as will enable us to make a creditable exhibition? I am not well posted as to the facts elsewhere, but in the neighborhood of Minneapolis, at Excelsior, and elsewhere in this vicinity the apple crop is nearly a failure, and we could not be depended upon to contribute much to the display.

Mr. Brimhall. The apple crop is also poor about St. Paul.

Mr. Brand. And in our part of the State it is hardly up to the average.

The Chairman. I can only speak of our own orchard at Lake City. There we have for some reason a very full and promising crop. Our Secretary is usually well posted in these matters. If there is any fruit anywhere he generally knows where to find it. I think we had better hear from him.

The Secretary. Taking a general view of the apple crop in the State, it is a failure here, as in almost all the States this year, owing to unfavorable conditions since the spring opened, yet there are exceptions. In certain belts and spots as fine apples can be found this year as ever. We can supply from Lake City and vicinity all the sorts usually seen at our fairs, and in good condition; and by a careful search about this and other portions of the State, I am satisfied we can make a fairly representative collection. But this will take time and money, expert judgment and handling and great care. The growing season will be late. This will enable us to put in the Duchess in firm shape to head the show alongside of the Wealthy. As to grapes, there is a fair prospect to get them ripe enough in some of our warmest vineyards to show the fine bloom and quality of which Minnesota grapes are capable. It would be a misfortune to be obliged to go to Philadelphia without our grapes. I would like to hear from Mr. Gould as to the prospect of getting them ripe enough at Lake Minnetonka.

Mr. Gould. If the grape can be ripened anywhere in the State this year before the 12th of September, so as to be fit for exhibition, I think Mr. Latham, at Excelsior, can get them ready. It depends upon the weather for the next month. I think there is an even chance for the earlier ones, perhaps an extended list.

Mr. Brimhall. The only question seems to be whether we can get the fruit for a good exhibition. Upon the assurances given us on that point, I am in favor of appointing our Secretary as our representative in connection with Prof. Porter. and place the whole matter of collecting and taking on the fruit in his hands, and that he make as good a display as possible; and I make a motion to that effect.

Mr. Brand. I second the motion.

The Secretary. Before you take any final action let us come to at least a partial understanding about the expense. I wish I could afford to give the Society my time in this matter; it would be a labor of love, for nothing suits me better than to go among and be with our fruits, but as I am situated, I should have to ask some compensation, besides the expenses incurred. I am willing to con-

tribute my time in attending the Philadelphia meeting, and that will probably be about my share.

Mr. Grimes. I am in favor of leaving the whole matter of expense within the limits we have estimated to the judgement of Mr. Gibbs. The Society has confidence that he will incur no more than is necessary; and as to compensation for his time in looking up and getting the fruit together, that the Executive Committee allow him what is reasonable.

Mr. Gould. From the discouraging prospects about the apple crop in our section, I had concluded not to vote one way or the other about trying to make this exhibition; but from the assurances given here, and with the understanding that the money we appropriate for the purpose will not be used, unless it is found at last that the fruits are creditable in variety and quality, I will support the motion.

The Secretary. At the February meeting of the Committee, Prof. Porter, Mr. Emery and myself were appointed a Committee to wait upon the Governor and ask his aid to secure an appropriation by the legislature for this purpose; but it was late in the session, and nothing could be done. I think there is no doubt but that Governor Hubbard is with us in the opinion that a general display of our fruits at the American Pomological Meeting will greatly add to the credit and pecuniary benefit of the State, and if we should properly present the matter through a committee, he might deem it right to defray a part of the expense from the Governor's contingent fund. I see no objection whatever to our presenting this suggestion for his consideration.

Mr. Grimes. From examination of our finances I see that we can carry out the project of this representation and fruit display by an appropriation from our own treasury within the estimate we have made, and I think we had better adopt the motion of Mr. Brimhall, and then after we adjourn, go and see the Governor and get his aid if we can, as it is a matter of general state interest, and we can make good use of our own funds in our regular work.

The motion was then put by the Chairman and was adopted unanimously.

The Secretary. It is the understanding then that whatever the action of the Governor may be there is appropriated from our treasury a sufficient amount of money to cover all necessary expenses, within the estimate.

Mr. Grimes. That will be the understanding. The Committee then adjourned, and immediately repaired in a body to the Governor's

room. Upon a statement of the facts by the Committee the Governor said he recognized the importance of having the State represented at Philadelphia, and he regretted that for want of time an appropriation had not been made by the Legislature at its last session. He would take the subject under advisement and set aside a portion of the fund placed in his hands for general State purposes, to aid in the expense of the collection of our fruits and their exhibition as suggested.

Subsequently, the Governor forwarded to the treasurer of the Society his check for \$200.

Bills allowed and orders drawn :

Aug. 8, Secretary's Salary, 3d quarter.....	\$50.00
Aug. 8, Expenses of Executive Com. to St. Paul.....	21.95
	<hr/>
	\$71.95

Seventeenth Annual Winter Meeting, 1884.

PROGRAM.

The order of exercises will be announced as far as practical during the session.

Morning afternoon and evening sessions — 9 a. m., 2 p. m. and 7 p. m. — each day, except Friday.

PAPERS TO BE READ.

Seventeen Years' Tests of Native, Canadian, Russian and Western Apples, in Northeastern Vermont,	DR. T. H. HOSKINS, Newport, Vt.
Physiographic Conditions of Minnesota Agriculture,	PROF. C. W. HALL, University of Minnesota
Tornadoes	A. W. SIAS, Rochester, Minn.
Native Plums and the Apples of the River District of Southeast Minnesota,	O. M. LORD, Minnesota City, Minn.
A Beginning in Silk Worm Culture in Minnesota.	MRS. H. B. SARGEANT, Lake City, Minn.
Wild Flowers of Lake Pepin Valley	MISS SARA MANNING, Lake City, Minn.
Adaptations in Fruit Growing,	J. C. PLUMB, Milton, Wis.
Out-Door Recreations and Employments for Women,	MRS. I. E. TILSON, West Salem, Wis.
The Waupaca Seedling Apples,	WILLIAM SPRINGER, Fremont, Wis.
Blight in Fruit Trees,	F. G. GOULD, Excelsior, Minn.
Roses for the Northwest,	S. BARTER, Markesan, Wis.
The Garden in Literature,	OLIVER GIBBS, JR., Lake City, Minn.

REPORTS TO BE READ.

Report of the Treasurer,	J. T. GRIMES, Minneapolis, Minn.
Report of the Secretary,	OLIVER GIBBS, JR., Lake City, Minn.
Report of the Entomologist,	R. J. MENDENHALL, Minneapolis, Minn.

Report of Committee on Fruit Blossoms:

GEO. P. PEPPER, Pewaukee, Wis. PROF. J. L. BUDD, Ames, Iowa.

Report of Committee on Russian Apples:

PROF. J. L. BUDD, Ames, Iowa. M. PEARCE, Minneapolis.
 A. G. TUTTLE, Baraboo, Wis. CHARLES LUDLUFF, Carver.
 KNIGHT WHIPPLE, Northome. ANDREW PETERSON, Waconia.
 F. G. GOULD, Excelsior. A. W. SIAS, Rochester.

PETER M. GIDEON, Excelsior.

Report of General Fruit Committee:

PROF. E. D. PORTER, Minneapolis. O. M. LORD, Minnesota City.
 M. PEARCE, Minneapolis. W. K. BATES, Stockton.
 G. W. FULLER, Litchfield. J. M. UNDERWOOD, Lake City.
 A. W. SIAS, Rochester. O. F. BRAND, Faribault.
 R. M. PROBSTFIELD, Moorhead. J. H. BROWN, Lac qui Parle.
 J. S. HARRIS, La Crescent. E. H. S. DARTT, Owatonna.

Report of delegate to American Pomological Society and to Wisconsin State Horticultural Society,

OLIVER GIBBS, Jr., Lake City.

Report of Committee on Seedling Fruits:

PETER M. GIDEON, Excelsior M. PEARCE, Minneapolis,
 S. M. EMERY, Lake City. A. W. SIAS, Rochester.

Report on Market Gardening and Small Fruit Raising at Lake Minnetonka,

KNIGHT WHIPPLE, Northome.

Report of Superintendent of State Experimental Fruit Farm,

PETER M. GIDEON, Excelsior.

Report on Varieties of Grapes Tested,

CHARLES LUDLUFF, Carver.

Report of Finance Committee.

BUSINESS MATTERS.

Consideration of plan for Premiums on seedling winter apples.

Revision of fruit and ornamental tree list.

Election of Officers.

Location of next summer and winter meetings.

Plans for horticultural work in the state, searches for new seedlings, gathering and distribution of seeds and cions, etc.

MISCELLANEOUS.

Reception of the Wilder medal from the American Pomological Society.

Addresses by His Excellency Governor Hubbard, and others.

Reading and discussion of volunteer papers and letters, notes and abstracts in the hands of the secretary.

Opening and discussion of the question box.

FORESTRY DAY.

Friday, January 18th, 10 a. m.

SOME OF THE PAPERS TO BE READ.

The Timber-Culture Act—Should it be Repealed?

DR. FRANKLIN B. HOUGH, Lowville, N. Y

Adaptations in Forestry,

HON. GEO. H. WRIGHT, Sioux City, Iowa.

The Study of Forestry as an Important Contributor to Practical Education,

HON. H. G. JOLY, Quebec, Canada.

General discussion of the subject of forestry.

PREMIUM LIST.

APPLES.

Best display of Wealthy Apples, first, \$4.00; second, \$3.00; third, \$2.00.

For Plates of winter apples in good condition, any variety, first premium, \$2.00; second premium, \$1.00. Five specimens to constitute a plate.

GRAPES.

Best plate of grapes in good keeping order, \$2.00; second \$1.00.

PLANTS AND FLOWERS.

Best display of ornamental and flowering plants, \$5.00 and diploma.

Best floral design, \$7.00; second best, \$5.00; third best, \$3.00.

Best pyramidal bouquet, \$3.00; second best, \$2.00; third best, \$1.00.

Best single plant in bloom, \$3.00; second best, \$2.00; third best, \$1.00.

VEGETABLES.

Best display of potatoes,

Diploma.

Best display of new varieties potatoes never before exhibited

at a winter meeting,

Diploma.

Best display of winter vegetables,

Diploma.

- Best half peck first early potatoes, first, \$2.00; second, \$1.00.
 “ “ “ second early potatoes, first \$2.00; second, \$1.00.
 “ “ “ potatoes for winter and spring use, first, \$2.00; second, \$1.00.
 “ “ “ early onions, first, 75 cents; second, 50 cents.
 “ “ “ winter “ “ “
 “ “ “ parsnips, “ “
 “ “ “ table carrots, “ “
 Best winter squash, first, 75 cents; second; 50 cents.
 Best bunch celery, “ “
 Best winter cabbage, “ “

SEEDS.

- Best display Minnesota grown garden seeds, \$6.00; second best, \$4.00.

MISCELLANEOUS.

- Best display of canned fruits, \$3.00; second best, \$2.00.
 Best display of jellies, \$2.00; second best, \$1.00.
 Best jar mixed Pickles, \$1.00; second best, 50 cents.
 Best sample home-made vinegar, \$1.00; second best, 50 cents.
 Best sample comb honey, \$2.00; second best, \$1.00.
 Best sample strained honey, \$1.00; second best, 50 cents.

WORKS OF ART.

Best collection of paintings of Minnesota fruits and flowers in oil or water colors, \$5.00; second, \$3.00; third, \$2.00.

Best single fruit painting, \$3.00; second, \$2.00.

Exhibitors are expected to contribute the membership fee of \$1.00, unless already members of State Horticultural Societies or adjoining states.

For further information, address,

OLIVER GIBBS, JR.,

Lake City, Secretary.

JOHN S. HARRIS,

La Crescent, President.

Minneapolis committee of arrangements.—Col. John H. Stevens, J. M. Welles, J. T. Grimes, M. Pearce.

Superintendent of Exhibits.—Prof. E. D. Porter.

MORNING SESSION.

First Day, January 15, 1884.

COLLEGE OF AGRICULTURE, MINNEAPOLIS, }
Tuesday, January 15th, 1884. }

The society met at 10:30 a. m., and being called to order by the president, was welcomed to Minneapolis by Col. John H. Stevens in the following address:

COL. STEVENS' ADDRESS.

Mr. President, ladies and gentlemen of the State Horticultural Society:

In behalf of the citizens of Minneapolis, I bid each one of you a most cordial welcome, and tender you their warmest hospitalities. They trust that your deliberations may be fraught with much moment to the future destinies of the Northwest. Your labors heretofore have been of such a character as to warrant this conclusion; for seldom has an organization accomplished more real lasting benefit to the people of the state, and judging the future by the past, we may expect to reap a golden harvest in the propagation of fruit, flowers, and everything else that appertains to horticulture, through your efforts. Our citizens feel honored by your presence, and will endeavor to make your sojourn with us pleasant, assuring you that we all feel greatly interested in your noble calling, which has a tendency to make our thresholds so happy.

*RESPONSE OF PRESIDENT HARRIS.**Colonel Stevens and the Citizens of Minneapolis :*

Wherever in the world horticulture has gained a foothold; wherever you find fruitful orchards and vineyards and the air is laden with the perfume of flowers; wherever you find a people or family who manifest a taste for choice fruits, beautiful flowers and ornamental trees, plants, and vines, you find refinement of sentiment and elegance of taste, that are a sure index of love, refinement and beauty within. This we have found in a marked degree among this people who now welcome us to their hospitality and homes, and wish us God speed in our work. Our mission is to introduce horticulture into every home in Minnesota, in county, town and city; and it rejoices us to hear that our mission is appreciated by you who dwell in this great and prosperous city. We aim to develop character, increase intelligence, improve morals and advance everything in our art that can exert an influence in improving the conditions of the human race. We aim to transform into sources of profitable pleasure the crude elements of nature, and we believe that we are making some progress. A few of us have been actively and with zeal working in and for this Society for some years. Others of us have not been identified with it so long; but all feel a common interest in its welfare, and it makes us glad to-day to be assured in this way that our self-sacrificing labors are appreciated and have not been in vain, and we are glad to meet again in your beautiful city, and thank you for your cordial welcome to us. We hope and believe that our meeting with you will be pleasant to us, and we will endeavor to make its proceedings interesting and profitable to you, and we certainly wish you, whether members or not, to participate with us in our discussions, and give us the benefit of your experience and observations in the great industry in which we all feel so great an interest. Again we thank you for your hearty welcome.

The President then read his annual address as follows:

*ADDRESS OF PRESIDENT HARRIS.**Members and Friends of the Minn. State Horticultural Society:*

This is the seventeenth annual meeting of this Society, and it finds us in a condition to accomplish greater good than has been accomplished at any previous meeting. We meet again in this

familiar place, these halls sacredly dedicated to the study of scientific and practical agriculture and horticulture, and for such a meeting no more fitting place could have been selected. We have come on the invitation of the Regents and Professors of the State University and the citizens of this great and hospitable city, Minneapolis, the pride and joy of the Northwest. There is a fragrance and heartiness in the greetings we receive that assures us of a cordial welcome. All auspices are favorable and point to a pleasant meeting, and a profitable one for the cause of horticulture. We have gained a year in experience since the last annual meeting; and I trust that the deliberations and work of this meeting will prove to the people of our state and the outside world that the experiences of the year have increased our wisdom and fitted us to enter anew upon the work before us with a better understanding of the work and the methods of doing it. The year has exhibited some phases that tend to impress upon our minds that in some respects it has been a remarkable one. Beginning with the burning of the Newhall house at Millwaukee, upon the 9th of January, fires, collisions and train wrecks, earthquakes, explosions, and tornadoes, &c., followed each other in quick succession and with such fearful and unparalleled destruction to life and property as to strike dismay to the stoutest hearts. While the late and early frosts and unpropitious weather at times caused us to almost fear that the promise of "seed time and harvest" might fail us. A beneficent providence has had a care over us during all the year, and brought us into the beginning of the new year, and blessings rest upon us and upon all the institutions and people of this great state. The harvests have been good, and we have bread enough and to spare. In nearly every portion of our country the fruit crop has been a little below the average, and the apple crop was the poorest that has been known for several years, and the causes for the failure will afford topics for investigation and discussion in the various horticultural meetings of the present winter. In Minnesota, or in some portions of it, the crop of apples was fair, and comparatively much better than in other Northern States, which shows clearly that there are other causes for failure in fruits than the severe cold of winter. We open this meeting with abundant reasons for congratulation upon the growth and prosperity of our society, and the increased confidence it is gaining upon the minds of the people and the fraternal relations existing with adjoining State Societies. The noted events of the year having a bearing upon our work, and in

which we are most particularly interested, have been our summer meeting in June at this place, which was a marked success, the meeting of the American Forestry Association, which took place at St. Paul during my absence from the State, and the meeting of the American Pomological Society at Philadelphia in September, at which our Society won high honors as you will hear by the report of the delegate who exhibited our fruits upon the occasion.

HORTICULTURE AT THE FAIRS.

The horticulture at the fair the last season showed a great falling off from previous years. The fair at Minneapolis was held a few days too early in the season for apples, except two or three of the early or summer varieties. At the State Fair at Owatonna, there were less than a dozen exhibitors, and but about 40 varieties shown. Among the exhibitors who showed any thing besides Duchess, Wealthy and Siberans, were J. T. Grimes, E. H. S. Dart, Geo. Clark, S. Bates and J. S. Morris & Son. The display of flowers was fine, but not large, and was contributed by the ladies of Owatonna and Mr. Dennerlins, the only professional florist of the city, and most of them generously declined to receive any premiums.

This meager show was partly owing to the failure of the fruit in portions of the State, the injury to it from cyclones in the part of the state where the fair was held, and from changes in the premium list favoring amateurs, and making it unprofitable for professional exhibitors to pick up and bring in large collections that would carry off the best of the awards, and drive out the smaller growers. At the exposition of the Southern Minnesota Fair Association, at Rochester, the horticultural display was much better, as it contained the principal part of the fruit from the State Fair, and in addition large and fine collections from A. W. Sias, E. B. Jordan, R. L. Coterell and others. No ripe grapes were shown at any of the fairs. The display of flowers at Rochester would compare favorably with any ever made in the State, but was largely contributed by the florists, Salzer & Losey, of La Crosse, Wisconsin. It should be the aim and desire of our society to extend its benefits and influence to all the citizens of this state. I believe that some good might be done at the State Fairs, by bringing our influence into operation as a State Association of horticulturists. There is a manifest propriety in this, as Agriculture and Horticulture are kindred interests, and in every Industrial Exposition of the state,

each should have a prominent representation. An exhibition exclusively of fruits and flowers draws only the ardent admirers of Pomona and Flora, and thus it loses its power for educating the masses. We should have convenient headquarters upon the State Fair Grounds, where all persons interested in horticulture can get together for consultation and the discussion and the decision of intricate questions that frequently arise, and if evening sessions were held for the investigation and discussion of suitable topics, our membership would be largely increased and it would be a convenient way for getting our publications into the hands where they may do the most good. The result would be the stimulating of the horticultural interests of the state among a large class of our citizens who are not now taking an active part with us. The State Agricultural Society has always recognized us as an auxiliary and allowed us one member upon the Board of Managers, furnished space and offered very liberal inducements in the way of premiums to draw out a creditable display of our products. In just so far as we fail to assist and encourage the State Agricultural Society, in making a successful annual fair, we come short of our duty and cripple our usefulness.

We have adopted one practice which I think will result in great good to the Society. I refer to that of electing to life honorary membership such men as have conferred lasting benefits upon the Society, by long and faithful service as members, and men of this and other states, who have devoted their lives to the cause, and have acquired notoriety for their achievements in progressive horticulture or other sciences bearing intimate relations to it. I take this occasion to recommend that some action of the Society be taken whereby it shall be made a perpetual "roll of honor," and that the Secretary be instructed to arrange the names of the list in the order of their election to the honorable position, and that upon the removal of any one by death a star be prefixed to note the same, and there to remain forever. I would further recommend that the name of our lamented friend, Leonard B. Hodges, be placed upon the roll next to that of Dr. John A. Warder, deceased. Also that the name of the late Dr. P. A. Jewell, be placed upon the roll. There are a few other men to whom this Society and the cause of horticulture is indebted for able and efficient help rendered in those days when to be a working member of the Society called for self-denial, members who have given their time and spent their money freely to bring the Society to that condition that should command the notice and respect of our State Legislature that secured

for us the publication of our transactions, the purchase and working of the experimental farm of which the venerable Peter M. Gideon is Superintendent, and an annual appropriation to help us in the prosecution of our work. First among these I name Col. D. A. Robertson, of St. Paul. No man in the State better deserves the highest honors, we are able to confer upon him. He stands first in point of faith and energy in the early attempts to introduce fruit culture into this state. In the winter of 1865 and 1866 he sent out circulars for information and opened a correspondence with the leading men of the state who had made attempts at fruit-growing, and he contributed to the Pioneer Press two lengthy and able articles which appeared in the issue of March 1st and March 14th 1866. Those articles were of inestimable value to the state, and proved a forerunner of the organization of this Society, which occurred in the October following, and of which he was very properly elected the first President. Next I would name L. M. Ford, formerly a prominent florist and nurseryman at Groveland, near St. Paul. In 1860 he, with Col. J. H. Stevens, edited "The Farmer and Gardener of St. Paul," and afterward for many years he filled the position of Agricultural editor to the Pioneer Press. Although he was not one of the original twelve who organized the Society, he became identified with us in the early years of our existence and rendered the society valuable and efficient aid. On January 23d, 1874, he was elected to the office of secretary, and held it for one year, discharging the duties without compensation and paying most of the office expenses, only a small part of which was ever returned to him. His labors have been labors of love, never prompted by the "almighty dollar," and now in our day of prosperity it is meet that we should show some recognition of his services. Next I will name Truman M. Smith of St. Paul an earnest, hard-working, self-denying, liberal-minded horticulturist. He became a member of this Society in 1868; has always been an efficient worker, and for many years discharged the duties of President with honor to himself and profit to the Society, and he has done very much to encourage and advance fruit culture in the state by the magnificent displays of fruit he has at various times made before this society and at the State Fairs, the American Pomological Society, and at the centennial exhibition at Philadelphia, for all of which he received no compensation except only in the satisfaction of having aided in the development of the horticulture and welfare of the state. Next J. T. Grimes, of Minneapolis, who became a member in 1868, has con-

tinued with us and one of us and been an earnest worker ever since. He has been a delegate from this Society to the special meeting of the American Pomological Society, and the manager of the centennial display of fruits for this Society without expense or charge to us and to his efforts, with those of Wyman Elliot and a few liberal minded fruit growers too poor in purse to do more than donate fruits, we are largely indebted for the award of a diploma and medallion, which contributed very largely to influence the Legislature to donate to our society, annually the sum of \$1,000 to aid us in pursuing our noble work. He has also attended as our delegate the meeting of the Mississippi Valley Horticultural Society in 1880, and superintended an exhibition of fruits for the Society and defrayed the principal part of the expense. The last name that I shall present at this time is that of our modest friend, A. W. Sias, of Rochester. He was in at the birth of the Society, consequently is one of the "original twelve" fanatics who started the Society, and set the good work in motion, that is destined to push Minnesota into the front ranks as one of the fairest and best among the great sisterhood of free and enlightened states. He has kept up his membership except for a single year, and has filled the offices of Treasurer and Vice-President and has never been honoured so much by the Society as to receive the appointment of delegate to represent us before any other Society. These all are old worthies whose names and deeds will be held in reverence by future generations. They have done the work for nothing, and with others have paid for the privilege. Let us not longer fail to recognize their worth and remunerate them so far as in our power lies, and may the Minnesota State Horticultural Society never want for scores of such liberal true-hearted men to conduct her affairs and bear her on to the victory.

LOCAL AND COUNTY SOCIETIES.

The Minnesota State Horticultural Society is legally constituted, and has its duties and obligations. Article 2d of the enactment reads—"The object of the Society shall be to collect, condense, and collate information relative to all varieties of fruits, flowers, and other horticultural productions and dispense the same among the people." The most thorough and economical way of doing this would be through the agency of local and county societies. In order to help us to carry out this provision of the law the Legislature granted to us an annual appropriation of \$1000. It is our

sacred duty to see that this appropriation is properly and honestly used, where it will count the most. Education in horticulture is the crying want of the state. The most practical means for acquiring such education is through horticultural literature and horticultural societies. In horticultural meetings the experienced and practical, and those seeking information, are brought together. The experienced lose nothing in imparting information to others, the inexperienced gain much useful knowledge and are awakened to increase it by the study of the literature and the conducting of practical experiments. The time has arrived when there should be a society in every county, and to start such we should lend every aid in our power, and I recommend the setting apart of \$200 for the purpose of defraying the actual expenses of suitable persons to go out among the people and lecture, and organize such societies, to be paid after the work is done and approved by this society.

I think it would also be well to adopt a system of society membership. The Indiana society admit members into their society upon the presenting of a certificate of membership from their secretary and the payment of fifty cents, and report that it is working satisfactorily. We would thereby increase our own membership and give such societies an interest in us.

I farther recommend that a little of your attention be given to the subject of experimental stations. The Executive Committee have appointed twelve superintendents of such stations. As the work cannot be prosecuted without incurring some expense to the superintendents, this meeting should see that some arrangements are made to defray the expense of procuring seeds, scions, stocks to graft upon and postage and express, and charges for such of the superintendents as will engage in the work. The amount necessary would range from \$10 to \$25 for each station, until they are well underway. We have a constitution and by-laws; most of our new and some of our old members have never seen it. It would be well to direct that it be published annually in our transactions as a convenience for reference and guide to our work.

In Memoriam.

The year since our last Annual Meeting has been marked by the decease of an unusual number of noted men, and a number of prominent horticulturists are enrolled among the departed. I alluded to our departed associates, Hodges and Bowen, in my address before the summer meeting, and now it becomes my painful duty to mention the decease of two more noble men, who had endeared themselves to western horticulturists.

Arthur Bryant died at his residence in Princeton, Illinois, in March, 1883. Although not a member of our society, he had taken a great interest in the conservatism of our forests and the planting of new ones. He has held important positions in horticultural associations, contributed freely to public journals and was the author of the valuable book "Forest Trees for Shelter, Adornment and Profit," and he was in the fullest sense, a thoroughly educated and upright gentleman.

Dr. John A. Warder, who for distinguished services in our cause was two years since elected a life honorary member of this society, died on the 14th of July, aged seventy-one years. Hon. Marshal P. Wilder in speaking of him says: "No death has occurred in this Society (the American Pomological) since that of Andrew Jackson Downing which is more deeply lamented; his was a useful, generous, unselfish life. Beloved in life, his death was universally and deeply deplored: No; he is not dead, but has gone before us to partake of the everlasting fruits of the tree of life."

M. Cutler moved that a committee of three be appointed to consider the recommendations in the President's address. The motion prevailed, and Col. J. H. Stevens, G. W. Fuller, and J. T. Grimes were appointed to such committee; and G. W. Fuller, A. W. Sias, and M. Pearce were appointed as a Committee of Finance.

A communication was received from the Delta Sigma Society of the State University tendering the use of their room for the meetings and on motion it was decided to hold the evening meetings there, and to arrange the program so as to be as attractive as possible to a general audience.

AFTERNOON SESSION.

Tuesday, January 15th.

The session was opened by musical selections by the University Glee Club.

The committee on President's address reported as follows:

REPORT OF THE COMMITTEE ON THE PRESIDENT'S ADDRESS.

The Committee to whom was referred the President's annual address would respectively report:

That they have considered the various matters suggested by the President in his annual address, and find them all worthy of consideration. In the opinion of your committee a closer connection should be made with all societies of a kindred nature; that the State Society should extend its helping hand to local, district and county societies; that a greater effort should be made to add to the membership of the State Society, and, finally, your committee feel it to be their duty to congratulate the society on its highly prosperous condition, which we feel in a measure is due to the efficiency of its officers.

Your committee recommend that the following names be added to the roll of honorary life members of this society: P. A. Jewell, Leonard B. Hodges (deceased), L. M. Ford, J. T. Grimes, and A. W. Sias.

Respectfully submitted,

J. H. STEVENS,
G. W. FULLER.

On motion the report was adopted.

Credentials were presented by J. C. Plumb, of Milton, Wisconsin, as delegate from the Wisconsin Horticultural Society, and on

motion of Peter M. Gideon, it was voted to make Mr. Plumb an honorary life member of this society in consideration of his long and useful service in western horticulture.

Mr. Plumb thanked the society for the honor conferred on him and pledged his hearty co-operation with us in our work hereafter.

Prof. Porter on behalf of the Board of Regents extended a welcome to the members of the society to the buildings and grounds of the University, and especially invited them to visit the workshops and see the students in mechanics at their employments therein.

The Secretary's and Treasurer's annual reports were then read, as follows, and referred to the Financial Committee :

ANNUAL REPORT OF THE SECRETARY.

Mr. President and Members of the State Horticultural Society:

The year now closing has been a busy one for the Secretary and an eventful one for the society.

OUR ANNUAL REPORT.

At the close of our last annual meeting we found ourselves in possession of material for an annual report that might rank in size and contents with the best horticultural reports of other Western States, but hampered with a printing law that while professedly allowing us a volume of 300 pages—1,000 copies in cloth and 4,000 in paper covers—was yet so worded and so restricted as to cost as to make it entirely uncertain what it would be, and place it out of our power to prepare it intelligently for the press. As an illustration of its workings, the previous year we were directed to cut down our carefully prepared manuscript, which was done; then the State printer gave us another cut by introducing a lot of fine type, so, as he said, that it might be reduced to 300 pages, or get within the limit as to cost; and when the report finally came out, it contained only 135 pages, and the fine type made it almost unreadable. The difficulty lay in the limit of \$750 instead of having the limit solely on the size of the volume and the number of copies, leaving the cost to be governed by the printer's contract with the state for the printing and binding of that amount of matter; and as it was operating so badly with us, being a dis-

couragement rather than an incentive to the improvement of our work, an effort was made to get the law amended. Early in February, under instructions from the executive committee, I drew an amendatory bill, placed it in the hands of Hon. S. M. Emery, of the lower house of the legislature, who took charge of it, and it became a law. It was thought that for the present we could do with a less number of copies than the old law ostensibly gave us, and so the new bill was drawn for 3,500 copies instead of 5,000 as was before, the number of pages increased from 300 to 500 as a maximum limit, and the whole edition to be bound if necessary. Practically we did not ask an order for binding the whole edition, and probably never shall. We can always use a part in paper covers, and it is to our interest as well as our duty to economize for the state as much as possible in the matter. Up to 1883 we have never been able to get enough bound copies to supply our members and exchanges. Only a favored few could secure a bound volume; the rest had to take paper covers—mere pamphlets—which are presumed to have gone usually the way of pamphlets: first down flat on the shelves around the house, dust covered, disarranged and always in the way; then up garret, and finally to the rag gatherer for a tin whistle; and when wanted for reference to help out of a difficulty in the garden or orchard, never found. Now, friends, thanks to the liberality of the legislature, we have a volume that we are not ashamed of. It is printed in large type so that the old folks can read it in the evening; it can stand alone on the library shelf; its back is broad enough to have a title there that can be distinguished from other books; it is popular; folks want it; one member of the legislature asked me for 200 copies; I get any quantity of letters complimenting it; we are not ashamed to send it to Iowa, Wisconsin, Kansas, Illinois or Michigan, asking an exchange for their reports. It is a standard that we must respect for ourselves; improve it as much as possible, but never go below it. It will oblige us to always have good programs at meetings and do our level best to put in our time to advantage; and lastly, as I know from the experience of the last six months, it gives us a reputation that needs only good honest work on our part hereafter to secure the services of the best writers in the horticultural world for future volumes. Says one of the leading writers of papers at this meeting—a writer from abroad, of continental fame: “I consider it an honor to write for your report.” Said another: “I value it too highly not to be anxious to earn a copy of the next one by writing a paper for it.” And I have no fear, if we keep on

in well doing, that the legislature will repeal our law ; but rather, if the people want more copies, they will be provided. If we grow dull, lazy or trifling, they ought to repeal it.

THE REPORT FOR 1884.

That the report for 1884 need not be a retrograde, but rather an advancement, the materials now in hand, and the prospects for this meeting, afford good promise.

EXPENSES OF DISTRIBUTING REPORTS.

By the change in the printing law the expense of the distribution has to be borne by the society.

Previous to that, by a construction of two acts in reference to our society, not in harmony with each other, the Secretary of State furnished a part of the postage. At the summer meeting an appropriation of \$75 was made for this expense, but it was not enough, and while the law remains as it is, it will be necessary to estimate the cost of postage on the distribution at \$100 per year at least, in order that it may be promptly done, and to our best advantage, until we succeed in having local societies organized that will take them by express or freight in bundles, and attend to the distribution to members, officials and the press, for us.

EXCHANGES.

We receive in exchange a small number of copies of other state societies and from the Montreal Horticultural Society. I am in hopes soon, if we keep up the present high grade of our work, that we can get enough in exchange to supply all of our members who want them. A full file of reports of other societies is very essential to any one writing papers for our meetings, and nothing is more productive of good writing and increasing the list of writers than the distribution of this kind of literature.

THE CANADIAN SOCIETIES.

We have been deriving much benefit, for years past, from the labors of the Montreal Horticultural Society, and the Ontario Fruit Growers' Association, through the kindness of Charles Gibb of the one and President William Saunders of the other, in keeping us supplied with their reports and current literature; and now, we

have a society to the northwest of us, at Winnipeg. I put here on record the names of all the officers of the Winnipeg organization for future reference, as we may reasonably expect an intimate relation with this society, and when they come to systematic trial of trees and plants to discover adaptations in that region, our northern sections must be largely the gainers by it through this relation, and otherwise.

It is called the

MANITOBA FORESTRY AND HORTICULTURAL SOCIETY.

President—J. A. Miller.

Vice Presidents—Hon. M. A. Girard, Acton Burrows.

Secretary and Treasurer—Charles N. Bell.

Directors—W. B. Hall, J. B. McKilligan, Thomas Nixon, R. R. Keith, Hon. A. G. B. Bannatyne, J. M. Miner, Asa A. Burnham.

I have sent them full files of our reports, and the Forestry Association has furnished them with *The Tree Planter's Manual* and other publications.

SOCIETIES OF ADJOINING STATES.

Since I became Secretary of the Minnesota Horticultural Society I have labored steadily to obliterate the idea of State lines, as much as possible, in the Horticultural work of all the northwestern states. The system of sending delegates to each other's conventions is doing something for this, and the correspondence and reciprocal work of the secretaries is doing still more. It is to this idea that we owe the fact that we are not much behind Iowa in our present awakening to the subject of Russian adaptation of fruit and forest trees and plants, and pretty well up with Wisconsin in the study of fruit blossoms, geological and climatic adaptations. Think a moment, fellow members. Suppose that a year ago Prof. Budd had responded, substantially like this, to my application for his notes on Russia. "Oh no, we cannot do that; your report might get out ahead of ours; we are working for Iowa; Iowa must take the lead, and have the preference; wait and get the facts you want from our report." What would have been the result? Just one year's delay in spreading the facts before our people. Turn a look inward on your own thoughts now on this subject, and see how far ahead you are, how much your mind has been influenced

by this prompt publication which Prof. Budd, in the largeness of his views, enabled us to make. Blot out these Russian pages from our Report of 1883, and think with what snail-like pace and mole-like vision we should now be groping. In the same spirit I have contributed whatever materials I had in hand freely whenever asked for by other Secretaries, and a glance at our program will show any one, that our work at this meeting is to be very much benefited by contributions from other states.

In reference to some topics necessary to be treated of at this meeting to round out our program, I was utterly unable, after repeated invitations sent out, to engage a suitable writer from our own State, and it was only after attending the meetings of other societies that the vacancy was supplied. And this reminds me to say, that so long as the laboring oar in correspondence, the selection of topics and writers for our programs, in getting up the current horticultural points of the year, used in the compiling and editing of the Annual Report, rests upon the Secretary, he should, in order to do himself and the society justice, and in order to fairly bear the responsibility that he is held to for a good report, be an *ex officio* delegate to all the Horticultural and Pomological Societies, at which meetings our society is to be represented, whenever he can attend them, with such other of our members as may be appointed.

MEMBERSHIP.

Our membership is steadily but too slowly increasing. I would again urge you to devise some scheme of canvassing to secure a larger constituency. We have only about one hundred members; we ought to have a thousand. What is our mission? To push fruit culture—yes, apple growing—to the northern limit of the wheat plant; to make it successful everywhere in the Northwest; to find or make the winter apple that shall unite to the beauty and quality of the Wealthy, the keeping qualities of the Willow Twig, the winter hardiness of the Transcendent and the non-blighting of the Duchess of Oldenburg. To find the adaptation and the proper culture of forest trees and domestic plants for all our varied belts of soil and climate; to overcome the difficulties of all tree culture and all horticulture; to promote a love and practice of rural adornment around the homes of our people. Surely, these are aims good enough and popular enough to enlist public interest and extend our membership if we go about it right. But if the mountain will not come to Mahomet, what then? Mahomet must go to the

mountain ! If the one thousand members do not come to us, we must go to them, with the press gang of persuasion and a copy of our report, including the back numbers, and bring them in. In a word we need to set afoot some good missionary work. It will pay now, and pay still better hereafter ; for in horticulture there are no backsliders.

THE PRIZE ESSAYS.

A few days before the departure of Wyman Elliot for California, I received a notice from him that the committee on the essays about Orcharding in Minnesota had awarded the prize of twenty-five dollars to Hon. R. P. Speer, of Cedar Falls, Iowa. An order for the amount was drawn on the treasurer and sent to Mr. Speer, and it has been paid. The prize on the essay on Seedling Fruits was awarded to Mr. Peffer, and that also has been paid.

THE AMERICAN FORESTRY CONGRESS.

At the summer meeting of our Society a resolution was presented by Col. Stevens and adopted, expressive of our good will and hospitality towards the American Forestry Congress to assemble August 8, in St. Paul. I attended this session of the Congress, and did what I could to carry out the spirit of the resolution. Copies of our report of this year were furnished to the members in attendance with the compliments of our Society, under instructions from the Executive Committee, and a resolution of thanks was passed therefor. On the second day of the session I had the honor of receiving from the ladies of the Jewell Nursery at Lake City, a large shipment by express of cut flowers in button hole bouquets, baskets, hand bouquets, &c., and of presenting the same to the Forestry Congress with the compliments of the donors and of the State Horticultural Society. They were turned over by the President of the Congress to Hon. H. G. Joly of Quebec, for distribution to the members, and the occasion formed a pleasant episode in the closing hour of the session.

THE AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE.

I also attended the meeting of this Society a portion of its time to see what could be found for the advancement of horticulture. Its biological section under the charge of Prof. Wm. J. Beal, of the State Agricultural College at Lansing, Michigan, and who is

also Secretary of the American Pomological Society, discussed with the zeal and accuracy of scientists several questions of importance to our branch of agriculture.

But what I prized most in having the privilege of attending both these meetings was the opportunity to become acquainted with the prophets and seers of horticulture and forestry in attendance, men of distinction in the great knowledge they possess, and whose acquaintance is, to borrow an expression used long ago in reference to another, "a liberal education."

Even a mere synopsis of points from the meetings would take too much time and space. The most that can be done now is to refer students of horticulture and forestry to their reports when published.

GENERAL BUSINESS.

Our constitution requires the Secretary to report to the Society an abstract of the matter that has come into his possession. In pursuance of this, I call your attention to a copy of the rules of the American Pomological Society, and a portion of President Wilder's address relative thereto, recently sent out by the secretary under a resolution of that Society for the action of kindred societies, and recommend that this matter be referred to a committee to report at our next annual meeting or sooner, if desirable, the rules and the portion of the address referred to to be first printed in our annual report, and which are as follows :

"AMERICAN POMOLOGICAL SOCIETY."

At the recent meeting of the American Pomological Society held in Philadelphia, Mr. J. B. Rogers, of New Jersey, made the following motion, which was unanimously adopted: "That the Secretary of this Society be instructed, at an early day to send copies of our rules and the portion of the President's address referring to the names of fruits, to all kindred societies in America."

MARSHALL P. WILDER, President,	
W. J. BEAL, Secretary,	Boston, Mass.
Lansing, Mich.	

The rules adopted, and the portion of the President's address referred to are as follows:

RULES OF THE AMERICAN POMOLOGICAL SOCIETY.

SECTION I.

NAMING AND DESCRIBING NEW FRUITS.

Rule 1.—The originator or introducer (in the order named) has the prior right to bestow a name upon a new or unnamed fruit.

Rule 2.—The Society reserves the right, in case of long, inappropriate, or otherwise objectionable names, to shorten, modify, or wholly change the same, when they shall occur in its discussions or reports; and also to recommend such changes for general adoption.

Rule 3.—The names of fruits should, preferably, express, as far as practicable by a single word, the characteristics of the variety, the name of the originator, or the place of its origin. Under no ordinary circumstances should more than a single word be employed.

Rule 4. Should the question of priority arise between different names for the same variety of fruit, other circumstances being equal, the name first publicly bestowed will be given precedence.

Rule 5. To entitle a new fruit to the award or commendation of the Society, it must possess (at least for the locality for which it is recommended) some valuable or desirable quality or combination of qualities, in a higher degree than any previously known variety of its class and season.

Rule 6.—A variety of fruit, having been once exhibited, examined, and reported upon, as a new fruit, by a committee of the Society, will not thereafter, be recognized as such, so far as subsequent reports are concerned.

SECTION II.

COMPETITIVE EXHIBITS OF FRUITS.

Rule 1.—A plate of fruit must contain six specimens, no more, no less, except in the case of single varieties, not included in collections.

Rule 2.—To insure examination by the proper committees, all fruits must be correctly and distinctly labeled, and placed upon the tables during the first day of the exhibition.

Rule 3.—The duplication of varieties in a collection will not be permitted.

Rule 4.—In all cases of fruits intended to be examined and reported by committees, the name of the exhibitor, together with a complete list of the varieties exhibited by him, must be delivered to the Secretary of the Society on or before the first day of the exhibition.

Rule 5.—The exhibitor will receive from the Secretary an entry card, which must be placed with the exhibit, when arranged for exhibition, for the guidance of committees.

Rule 6.—All articles placed upon the tables for exhibition must remain in charge of the Society till the close of the exhibition, to be removed sooner only upon express permission of the person or persons in charge.

Rule 7.—Fruits or other articles intended for testing, or to be given away to visitors, spectators, or others, will be assigned a separate hall, room or tent, in

which they may be dispensed at the pleasure of the exhibitor, who will not however, be permitted to sell and deliver articles therein, nor to call attention to them in a boisterous or disorderly manner.

SECTION III.

COMMITTEE ON NOMENCLATURE.

Rule 1.—It shall be the duty of the president, at the first session of the Society, on the first day of an exhibition of fruits, to appoint a committee of five expert pomologists, whose duty it shall be to supervise the nomenclature of the fruits on exhibition, and in case of error to correct the same.

Rule 2.—In making the necessary corrections, they shall, for the convenience of examining and awarding committees, do the same at as early a period as practicable, and in making such corrections they shall use cards readily distinguishable from those used as labels by exhibitors, appending a mark of doubtfulness in case of uncertainty.

SECTION IV.

EXAMINING AND AWARDING COMMITTEES.

Rule 1.—In estimating the comparative values of collections of fruits, committees are instructed to base such estimates strictly upon the varieties in such collections which shall have been correctly named by the exhibitor, prior to action thereon by the committee on nomenclature.

Rule 2.—In instituting such comparison of values committees are instructed to consider:—1st, the values of the varieties for the purposes to which they may be adapted; 2d, the color, size, and evenness of the specimens; 3d, their freedom from the marks of insects and other blemishes; 4th, the apparent carefulness in handling, and the taste displayed in the arrangement of the exhibit.

T. T. LYON, South Haven, Mich.,
JOHN A. WARDER, North Bend, Ohio,
J. J. THOMAS, Union Springs, N. Y.,
C. M. HOVEY, Cambridge, Mass.,
P. J. BERCKMANS, Augusta, Ga.

Committee.

EXTRACT FROM PRESIDENT WILDER'S ADDRESS.

In former addresses, I have spoken to you of the importance of the establishment of short, plain, and proper rules, to govern the nomenclature and description of our fruits, and of our duty in regard to it; and I desire once more to enforce these opinions on a subject which I deem of imperative importance. Our society has been foremost in the field of reform in this work, but there is much yet to be done. We should have a system of rules consistent with our science, regulated by common sense, and which shall avoid

ostentatious, indecorous, inappropriate, and superfluous names. Such a code your committee have in hand, and I commend its adoption. Let us have no more generals, colonels, or captains attached to the names of our fruits; no more presidents, governors, or titled dignitaries; no more monarchs, kings, or princes; no more mammoths, giants, or Tom Thumbs; no more nonsuches, seek-no-furtheres, ne plus ultras, hog-pens, sheep-noses, big bobs, iron clads, legal tenders, sucker states, or stump-the-worlds. Let us have no more long, unpronounceable, irrelevant, high flown, bombastic names to our fruits, and, if possible, let us dispense with the now confused terms of Belle, Beurre, Calebasse, Doyenne, Pearmain, Pippin, Seedling, Beauty, Favorite, and other like useless and improper titles to our fruits. The cases are very few where a single word will not form a better name for a fruit than two or more. Thus shall we establish a standard worthy of imitation by other nations, and I suggest that we ask the co-operation of all pomological and horticultural societies, in this and foreign countries, in carrying out this important reform.

As the first great national pomological society in origin, the representative of the most extensive and promising territory for fruit culture, of which we have any knowledge, it became our duty to lead in this good work. Let us continue it, and give to the world a system of nomenclature for our fruits which shall be worthy of the society and the country,—a system pure and plain in its diction, pertinent and proper in its application, and which shall be an example, not only for fruits, but for other products of the earth, and save our society and the nation from the disgrace of unmeaning, pretentious, and nonsensical names, to the most perfect, useful, and beautiful productions of the soil the world has ever known.

Your attention is also invited to the following circular relative to a proposed international exhibit of fruits at New Orleans next winter:

AN INTERNATIONAL EXHIBITION OF FRUITS.

I desire to announce to all fruit growers, and to all persons interested in Horticulture, that an arrangement has just been effected by which we hope to secure in the winter of 1884-5 the most extensive and complete exhibition of fruits and other horticultural products that has ever been made.

The World's Industrial Exposition will open in New Orleans on the first Monday in December, 1884, and continue for six months. This will be in the largest sense a World's Exposition of Industry, and will in many essential features surpass any exposition heretofore held in this or any other country. The provisions being made for this great fair are of the most generous character. The main building, now in course of erection, will cover thirty-two acres of ground, and will give far more exhibition space than any structure heretofore erected in this country. An Art Building, an Agricul-

tural Building, and a Horticultural Building, and other structures for special purposes, will all give most liberal accommodations to these several interests.

There are many favorable conditions which lead to the belief that this World's Fair will be more extensively visited, especially by agricultural people, than any fair heretofore held. The season is the one of greatest leisure for the rural classes, instead of one of greatest activity. It is the season when everybody at the North wishes to go South to escape from some portion of the trying northern winters. The city of New Orleans—the great commercial metropolis of the South—is full of novel attractions for the stranger, and has the mild winter climate of the Gulf of Mexico. And arrangements are already effected with all the great railroad lines leading to the city for passenger rates without parallel for cheapness.

Under all these favoring circumstances it seemed desirable that something more should be done for the great interests of horticulture, especially for those of pomology, than has hitherto been attempted. So it has been decided by the board of managers to give these interests a larger place than they have held in any other fair in the world. In addition to the completest possible display of trees, plants, and flowers, there will be held an international show of fruits. This has never before been done, or even attempted. This department will be organized and managed by the Mississippi Valley Horticultural Society.

The exposition managers will erect a building especially adapted to a display of plants and fruits. This Horticultural Building will be about six hundred feet long by one hundred feet wide, and will be a handsome and convenient structure, which, with the landscape embellishments adjacent, will cost \$100,000. They will, at an early day, issue a list of premiums for fruits, in medals and money, which will aggregate from \$12,000 to \$15,000. We expect to secure an exhibit of all such fruits as will be in season at any part of the period of six months during which the exposition will continue, or as can be held over by the most efficient system of cold storage. We expect these exhibits from every state and territory of the United States; from the provinces of British North America; from Mexico and the Central American States; and from all the important nations of the world. The same classes of fruits from all the temperate climates of the globe will be placed side by side for comparison. The citrus fruits, and others of great commercial value, will be gathered from the Gulf States, from California, from the Mediterranean countries, from South America, from India, China, and the islands of the sea.

This exhibition will be continuous for the whole term of the exposition, showing every fruit in its season, and continuing many kinds beyond their season by the help of cold storage. The most ample and complete cold storage facilities to be found on the continent have been placed in control of the management by the New Orleans Refrigeration Company.

Thus it will be seen that an Industrial Fair Association has at last been found, able and willing to recognize the importance of horticulture and the great fruit interests of this country and the world, and to provide for their exhibition in the most liberal spirit as one of the most important and attractive departments of a world's exposition. I cannot be mistaken in my belief that these generous invitations, which are wholly without precedent in the history of fairs and expositions, will be responded to by the fruit growers, and the agricultural and pomological societies of this and other countries; and that we shall see in New Orleans next winter such a varied and profuse exhibition of the pomological wealth of all nations as the most enthusiastic horticulturist has not dreamed of beholding, and which will be of incalculable benefit to the vast interests represented.

Premium lists will be issued at an early day for distribution to all interested. All inquiries and applications for space should be addressed to the undersigned, at Cobden, Illinois, U. S. A.

PARKER EARLE,

President Mississippi Valley Horticultural Society, and
Superintendent Department of Horticulture,
World's Exposition, New Orleans.

I have also received the following announcement and program of the meeting of the Mississippi Valley Horticultural Society to be held at Kansas City, Missouri, next week :

THE MISSISSIPPI VALLEY HORTICULTURAL SOCIETY.

The fifth annual meeting of this Society will be held in Kansas City, Missouri, on Tuesday, Wednesday, Thursday and Friday, January 22d, 23d, 24th and 25th, 1884. President's address and officer's report at 2 p.m., 22d.

The prestige that the Mississippi Valley Horticultural Society has already gained, as the head of the system of horticultural organizations within the great and prosperous valley, from which it takes its name; the very excellent program herewith presented, including as it does, leading horticulturists and fruit growers from all parts of the country; the fact that this meeting is to be held in the most progressive and enterprising city in the West, and, that the Society goes to Kansas City as the guest of the Missouri State Horticultural Society, are of themselves a sufficient guarantee that the meeting will be a grand one.

This meeting is purposely fixed at a time when farmers and fruit growers are resting from the toils of the year, and when they can best spare a few days time in mutually improving their minds, through such facilities as meetings of this kind only can afford. It also comes after the close of all state and important local society meetings, thus bringing together its membership fresh from their respective schools of horticultural knowledge.

A VOLUNTARY EXHIBITION

Of fruits and other horticultural products will be made in connection with the meeting, and as this occurs in one of the best fruit regions of our country, we feel confident that this feature will prove of great interest to all who may attend.

ENTERTAINMENT.

The St. James Hotel will be headquarters, at two dollars per day. Barnum's Hotel \$1, and other hotels at from \$1 to \$2 per day.

RAILROAD ARRANGEMENTS.

The Missouri Pacific System of roads, including the Wabash, and embracing about ten thousand miles of road, extending as far north and east as Chicago, Detroit, and Toledo, and as far south and west as New Orleans, Galveston and El Paso, will return members in attendance, who have paid full fare over these lines, at one cent a mile, upon the certificate of the secretary of the society. The Chicago & Alton, C. B. & Q. Keokuk, St. L. & N. W., Chicago, B. & K. C., Illinois Central, Cairo Short Line and Hannibal & St. Joe roads will return members on the same terms. The Ohio & Mississippi will sell tickets to St. Louis and return at one and one-third fare, to members indorsed by the Secretary. The Louisville and Nashville will give reduced rates to members, applying to its Gen. Passenger Agent, C. P. Atmore, of Louisville, Kentucky.

THE TRANSACTIONS.

Including the valuable papers promised in this program, together with a full synopsis of all discussions upon topics presented during the meeting, will be published in a style corresponding with the first volume of proceedings issued during the last year; a volume which has called forth high encomiums from eminent horticulturists and pomologists. Members will be supplied by mail with a copy without further cost. A limited number of new members can be supplied with copies of the past volume for \$1.00 in addition to the membership fee.

MEMBERSHIP.

The fee of membership is \$2.00 per annum. This may be paid at the meeting, or remitted, in any safe manner, to either of the undersigned, prior to the meeting, or soon thereafter. Those unable to attend the meeting are requested to remit the fee of membership as above, and in due time they will be supplied with a copy of the transactions.

BUSINESS DIRECTORY.

In addition to the usual features of such volumes, the transactions will contain a business directory for those engaged in horticultural pursuits, either as producers of fruit and vegetables for market, as growers of trees and plants for sale, as manufacturers of fruit and vegetable boxes and packages; as commission men and dealers, as seedsmen and florists, or as manufacturers of agricultural implements and machinery.

This directory will be plainly printed in uniform type, with two lines of space given each patron. The Directory fee is \$5.00 or \$3.00 to those already members of the society. No name will be admitted unless accompanied by satisfactory reference. Each patron of the Directory will be furnished a copy of the transactions, free by mail. It is the desire of the Society to furnish in this way a reliable medium of advertising between parties mutually interested.

PARKER EARLE, President,
Cobden, Illinois.

W. H. RAGAN, Secretary,
LaFayette, Indiana.

J. C. EVANS, Treasurer,
Harlem, Missouri.

PROGRAM OF THE MEETING.

The following papers will be presented to the Mississippi Valley Horticultural Society, at its fifth annual meeting in Kansas City, Missouri, January 22d, 23d, 24th, and 25th, 1884, and in such succession as may be determined by the committee on order of business. Their presentation will be followed in each case by such discussion as may be suggested by the writers. These papers will be brief and practical, the object being to bring out the points of interest in the discussions that may follow.

1. Circulation of Sap.....Prof. J. W. Robson, Cheever, Kan.
2. Trees Peculiar to Texas.....T. V. Munson, Denison, Texas.
3. Some Experimental Work in Forest Tree Culture
.....Prof. W. R. Lazenby, Columbus, O.
4. Supplemental Report on Insects Affecting the Strawberry,....
.....S. A. Forbes, Normal, Illinois.
5. The Fruits and Climate of North-Eastern Europe
.....Prof. J. L. Budd, Ames, Iowa.
6. Forests and Timber Interests of Puget Sound.....
.....Ex-Gov. Robt. W. Furnas, Brownville, Nebraska.
7. Ornamental Trees and Shrubs of Alabama.....
.....Dr. Chas. Mohr, Mobile, Alabama.
8. Recent Discoveries Concerning Grape Rot
.....Prof. Wm. Trelease Madison, Wisconsin.
9. Horticulture in Ontario D. W. Beadle, St. Catharine's, Ontario.
10. The Educational Power of Horticulture. Mrs. G. A. Tryon, Galesburg, Ills.
11. Strawberry Culture J. H. Hale, South Glastonbury, Connecticut.
12. Berry Culture along the Atlantic Coast
.....J. T. Lovett, Little Silver, New Jersey.
13. Our Future Peach Supply ... Chas. W. Garfield, Grand Rapids, Michigan.
14. Semi-Tropical Fruit Culture. ... E. M. Hudson, New Orleans, Louisiana.
15. Horticultural Exhibitions : How to Conduct Them
.....Major Z. S. Ragan, Independence, Missouri.

16. The Peach Interests in the Central States Pres. J. S. Beatty, Simpsonville, Ky.
17. Orchardng on the Plains G. C. Brackett, Lawrence, Kansas.
18. Horticultural Resources of the Mountain Region.. D. S. Grimes, Denver Col.
19. Ornamentation of Homes E. Y. Teas, Dunreith, Indiana.
20. Small Fruits for the Family and How to Have Them Pres. Sylvester Johnson, Irvington, Indiana.
21. Selection and Arrangement of Trees and Shrubs for a Country Place..... Prof. W. J. Beal Lansing, Michigan.
22. How to Save the Apple Crop..... J. S. Woodward, Lockport, New York.
23. Stone Fruit Cultivation in California Prof. Geo. Hussman, California.
24. The New Grapes..... Geo. W. Campbell, Delaware, Ohio.
25. Cultivation and Marketing Raspberries.. Pres. N. H. Ohmer, Dayton, Ohio.
26. Grapes that Succeed in Missouri and Kansas Samuel Miller, Bluffton Missouri.
27. Horticultural progress in the South... Dr. Samuel Hape, Atlanta, Georgia.
28. Conditions of Profitable Fruit Culture in Minnesota..... Oliver Gibbs, Jr., Lake City, Minnesota.
29. Blossom Blight in the Apple..... Geo. P. Pepper, Pewaukee, Wisconsin.
30. Pear Culture in the Southwest... Maj. S. H. Nowlin, Little Rock Arkansas.
31. Experiments at Agricultural Colleges..... Prof. J. J. Colmant, Agricultural College, Mississippi.
32. Market fruits of Kansas City..... L. A. Goodman, Westport, Missouri.
33. Gardening for Distant Markets..... J. E. Porter, Humboldt, Tennessee.
34. The Best Methods of Fruit Transportation.. F. A. Thomas, Chicago, Illinois.
35. The Best Fruit Packages..... E. T. Hollister, St. Louis, Missouri.
36. The value of Careful Packing and Handling..... E. H. Williams, Indianapolis, Ind.
37. The Trunks of Apple Trees..... Prof. T. J. Burrill, Champaign, Illinois.
38. Noxious Insects of the Orchard.... Hon. J. N. Dixon, Oscaloosa, Iowa.
39. Horticultural Experimentation.. Prof. James Cassidy, Fort Collins, Colorado.

In a letter from President Earle, which is in the hands of the Chairman of our Executive Committee, Mr. Underwood, our Society is strongly urged to send a delegate to the Kansas City meeting, both with reference to the business of the Mississippi Valley Horticultural Society, and for consultation with reference to the proposed international exhibition of fruits, at the World's Fair, in New Orleans. I would recommend the appointment of a committee to take both these announcements and President Earle's request into consideration.

COLLECTION AND DISTRIBUTION OF SEEDS AND CIONS.

Pardon me for taking up your time now by the introduction of this subject ; but I am so impressed with a sense of its importance, that I cannot forbear. Seeds of our hardiest and best old seedling apple trees, and younger ones, if they have been subjected to any severe tests and seem hardy, should be gathered up and distributed to grow stocks for grafting and for crossing in the blossoms. None should be allowed to go to waste till we have enough put out to test the various practical questions involved : the most important of which is to determine whether among the progeny can be

found any gain in hardiness, or a preservation of the hardiness of the parent, or will they be retrogrades? If hardiness is maintained or advanced, then let them grow and be used as seed-bearing parents for crossing for quality and long keeping, or for top grafting for early testing of new fruits, or for orchards on the top-work plan, or to use the seeds to grow stocks for root grafting.

Cions of the old seedling trees that are hardy where they stand and which are bearing desirable fruits, and those of other newly discovered and promising sorts, and we have a good many such, some of them long keeping apples, should be also distributed, not alone to experimental stations, but to members generally who will test them and report. I mention nothing new in this ; but introduce it for the purpose of impressing this fact, that we need to go after these cions, cut and pack them ourselves, and get them to headquarters in an expert way, as, except in rare instances, the owners of these trees are not successful in the handling of cions. An effort was made last winter to distribute some of these cions by correspondence only, and they mostly arrived dried up and dead. Nurserymen are testing all the new sorts they can find, but on a small scale ; commercially they are obliged by the necessities of business to propagate the well-known sorts that have an established reputation. Nearly all of our old seedling apple trees of apparent value and the Russian sorts promise to make this their bearing year; and this therefore is likely to be the golden opportunity to search for new acquisitions in varieties and test the fruits.

THE EXPERIMENTAL STATIONS.

Little has been done with these during the year for want of any system of collecting and distributing seeds and cions.

RUSSIAN APPLES IN CARVER COUNTY.

In my searches in August for fruit for the Philadelphia exhibit I came across a small orchard of Russian apples on the farm of Andrew Peterson, near Waconia, which I thought offered some useful lessons in the study of Russian adaptation, and which appeared to me to have a few varieties of considerable value, hitherto unknown to us, being in tree iron-clad, hardy and blight proof, and in fruit, large, handsome, productive and fairly good. In November I gathered up some cions of other sorts likely to be interesting to Mr. Peterson, from my own grounds and contributions of Under-

wood & Emery, and requesting Mr. F. G. Gould, of Excelsior, one of our Executive Committee, to go with me, again visited Mr. Peterson, and solicited an exchange of cions for the benefit of our Society. Mr. Peterson entered fully into the spirit of our mission, cut us a liberal supply of cions from his pet trees, many more than we could give him in exchange at the time, and entertained us hospitably. Mr. Gould will make you his report on these trees, and I will therefore only append a list of the cions received and distributed. It is expected that when the trees from these cions are ready, the new crop of cions will be cut and distributed to members of the Horticultural Society for general trial, the propagators reserving enough to compensate them for their trouble. In making this distribution we did not send to the Superintendents of all the experimental stations, but only to such as were known to be experts and having facilities for propagating. The larger share appearing in Mr. Gould's name covers an allotment for the new University farm to be delivered when Prof. Porter gets ready for them. On my return I reported the find to Mr. Gideon, who agreed to go and examine the trees and report to the society what he thought of them. Mr. Pearce has also visited them; Mr. Peterson is expected here with samples of the apples at this meeting, and on the whole if this little group of trees can stand the attention they are likely to receive, they must be extremely hardy. The following is the list:

TO WHOM SENT.	Lieby No. 240.	Charla- moff No. 262.	Hibernal No. 378.	Ostrakoff Gloss No 472.
F. G. Gould, Excelsior	4	2	6	4
Peter M. Gideon, Excelsior.....	2	1	2	2
O. F. Brand, Faribault	2	1	2	2
A. W. Sias, Rochester....	2	1	2	2
Underwood & Emery, Lake City ...	2	1	2	2
Oliver Gibbs, Jr., Lake City.....	2	1	2	2
G. W. Fuller, Litchfield	2	1	2	2

BILLS ALLOWED AND ORDERS DRAWN.

For the purpose of comparison with the Treasurer's report at this time, the bills allowed and orders drawn from commencement of last annual meeting up to Feb. 5, will be found scheduled on pages 209 and 210 of the annual report of 1883:

Since that date they are as follows:

1883.	
Feb. 24,	Salary of Secretary, first quarter\$ 50 00
March 3,	Wyman Elliot, reimbursement for cash advanced. 100 00
" 3,	J. S. Harris, expenses to St. Paul..... 12.85
" 5,	Secretary, expenses two trips to Minneapolis 11.00
" 8,	G. P. Pfeffer, prize essay on Seedlings..... 25.00
May 2,	Salary Secretary, second quarter..... 50.00
June 28,	Premiums at summer meeting—
	On Fruits .....\$23.00
	On Vegetables 5.50
	On Flowers 10.00
	<hr/> 38.50
June 28,	H. B. McKenney, printing and stationery.... . 13.50
" 28,	Johnson, Smith & Harrison, printing..... 2.00
" 28,	Mrs. James Bowen 10.00
" 28,	Secretary, office expenses (appropriation)..... 25.00
" 23,	Secretary, postage on Reports, " 75.00
" 28,	President's expenses to summer meeting..... 7.00
Aug. 8,	Secretary's salary, third quarter..... 50.00
" 8,	Expenses Ex. Committee to St. Paul..... 21.95
" 18,	O. Gibbs, Jr., delegate to Am. Pom. Soc. (appropriation).... 100.00
" 25,	" " " "*100.00
Oct. 20,	Secretary's salary, fourth quarter..... 50.00
Nov. 12,	R. P. Speer, prize essay, Orchardling 25.00
" 24,	O. Gibbs, Jr., delegate to Am. Pom. Soc.....†188.24

FUNDS TO THE TREASURER.

Since my last annual report I have paid over to the Treasurer eighty-four dollars for annual membership fees of 1883, and have in hand eight dollars as fees of members who are to be enrolled for 1884, which will be turned over at close of this meeting. To avoid misapprehension in comparing the Treasurer's account of receipts from Secretary with the names of members as printed in the annual report, I hope the members will not forget that in the last half of the year 1882, the Secretary was directed to carry all members then joining into the roll of 1883, without further payment. Fifteen were so carried over and the funds were paid to Treasurer, July 12, \$6, and December 13, \$9—1882. Two of them, Mr. Hendrickson and Mr. Cuzner paid again, inadvertently, in June, 1883, and they will go upon the roll of 1884 without payment.

*Upon this order only \$60 was paid. See delegate's report.

†Includes Treasurer's items Sept. 7 and 8, Grimes and Latham. See delegate's report and report of Treasurer.

Warrants have been drawn on the State Auditor, since my last report, in favor of our Treasurer during the past year as follows :

Amount due the Society to July 1, 1883.....	\$ 583.33
Amount due the Society July 1, to December 31, 1883.....	500.00
	<hr/>
	\$ 1,083.33

And the Treasurer has received also, as appears in his report, from the Governor's Contingent Fund, as a contribution for the Philadelphia exhibit of fruits of Minnesota the further sum of\$ 200.00

FINANCIAL CONDITION OF THE SOCIETY.

Our current receipts are derived from three sources only, interest on permanent fund, the annual membership fees, and the amount we receive from the State. Our disbursements are only such as are covered by orders signed and recorded by the Secretary, and the salary and incidental expenses of the Treasurer. This makes it easy to keep the run of our finances. The following will be the condition of the Treasury at the opening of the annual meeting:

Accrued interest on permanent fund.....	\$ 43.78
Cash balance in Treasury.....	172.29
	<hr/>
Total.....	\$ 216.07

To this will be added the membership fees collected and paid over at this meeting, estimated at \$100, and there is still due the Society from the State, on the appropriation for 1883, the further sum of \$400. The cash on hand and the accrued interest, \$216.07, as above stated, with membership fees to be received, will be sufficient to pay the balance due on current accounts, so far as they are known to the Secretary, and the premiums and expenses of this meeting, leaving the \$400 due from the State as a surplus with which to begin the year 1884; add to this our State appropriation for 1884, \$1,000 and the interest on our permanent fund, and deduct \$200 which is to be added yearly to that fund, and we shall have about \$1,200 available for current expenses of 1884.

SECRETARY'S ACCOUNT, POSTAGE, OFFICE, INCIDENTAL AND TRAVELING EXPENSES.

<i>State Horticultural Society.</i>	<i>Dr.</i>
Postage, including distribution of reports... ..	\$ 116 75
Express charges on reports and exchanges	13.00
Traveling expenses of secretary.....	24.05
Traveling expenses of delegate to Wisconsin society.....	24.86
Letter Heads and printing.....	7.00
Miscellaneous, stationery, &c.....	14.30

*Cr.**By appropriations as follows:*

1883.

Jan. 19, For incidental exenses	\$10.00	
Jan. 19, For delegate to Wisconsin horticultural society....	20.00	
June 28, For incidental expenses.....	25.00	
June 28, For postage on reports.	75.00	
Balance due secretary.....	69.96	
		<hr/>
	\$199.96	\$199.96

Bill of items included herewith and vouchers for information of the Finance Committee.

Many other matters of interest in the Secretary's work during the past year will come before the Society in other parts of the program and need not be introduced here, as the report is already somewhat lengthy.

I will say however in closing that the manuscript for the report of 1884, is all ready for the printers up to this date, and I am informed by our polite and wide-awake State Printers, Johnson, Smith & Harrison, of Minneapolis, that they are ready for it any time, and, if immediately supplied with the copy, they can in all probability do for us this year what we have always wanted heretofore, but could never quite accomplish—have the Report out in time for our readers to look it over before the spring planting.

In the off years of legislative sessions, like this year, 1884, when State printing is not so pressing, we may perhaps be always able to get our publication early in the spring.

Respectfully submitted,

OLIVER GIBBS, Jr., Secretary.

LAKE CITY, Jan. 5, 1884.

TREASURER'S REPORT.

Report of the Treasurer of the State Horticultural Society for the current year ending January 15th, 1884.

To the President and Secretary of the Minnesota State Horticultural Society:

The following account of the receipts and disbursements for the current year is respectfully submitted.

J. T. GRIMES,
Treasurer.

RECEIPTS.

1883.

Jan.	16,	Permanent fund.....	\$ 400.00
	16,	Interest (accrued).....	13.00
	16,	From U. S. Hollister (former secretary).....	7.00
	13,	Balance in treasury for current year.....	189.24
Mar.	5,	Balance State appropriation for 1882	500.00
June	26,	State appropriation from December 1st, 1882, to July 1st, 1883	583.33
		Membership fees for the current year.....	84.00
Aug.	8,	Of Gov. Hubbard to aid in sending delegate and making exhibit at the pomological meeting, Philadelphia.....	200.00
Dec.	31,	State appropriation to January 1st, 1884 (in part).....	100.00
Jan.	1,	Interest on permanent fund.....	30.78
Total receipts.....			\$2,107.35

DISBURSEMENTS.

1883.

Jan.	18,	To Oliver Gibbs, Jr., incidental expenses to date.....	\$ 25.33
	18,	To E. D. Porter express charges.....	4.40
	18,	To J. T. Grimes, expense to executive committee.....	6.85
	18,	To U. S. Hollister, secretary office expenses.....	5.85
	18,	To H. C. Stearns, reporter and copying.....	40.00
	18,	To J. S. Harris, expense on seedling committee.....	7.15

	18, To J. M. Smith, expenses from Green Bay and return	\$ 25.75	
	19, To James Bowen, librarian.....	10.00	
	19, To Oliver Gibbs, Jr., delegate to Wisconsin 1883.....	20.00	
	19, Oliver Gibbs, Jr., incidental expenses.....	10.00	
	19, Treasurer's salary for 1882.....	25.00	
	19, Premiums paid at winter meeting on fruits... ..	63.00	
	19, " " " " on flowers.....	9.00	
	19, " " " " on vegetables.....	36.25	
	26, E. H. S. Dart, delegate to Iowa	17.95	
Feb.	5, Expenses of executive committee to St. Paul.....	19.85	
	24, Secretary's first quarter salary 1883... ..	50.00	
Mar.	3, Wyman Elliott, cash reimbursed.....	100.00	
	3, J. S. Harris, expenses to St. Paul.....	12.85	
	3, Oliver Gibbs, Jr. expenses to Minneapolis in connection with the annual report.....	11.20	
	8, Geo. P. Pfeffer, prize essay on seedling fruits.....	25.00	
May	2, Secretary's second quarter salary....	50.00	
June	28, Premiums paid at summer meeting on fruits.....	23.00	
	28, " " " " on flowers.....	10.00	
	28, " " " " on vegetables... ..	5.50	
	28, H. B. McKenney, printing.....	13.50	
	28, Johnson, Smith & Harrison, printing... ..	2.00	
	28, Mrs. James Bowen, husband's salary, librarian	10.00	
	28, Office expenses of Secretary.....	25.00	
	28, Oliver Gibbs, Jr. postage on reports.....	75.00	
	28, J. S. Harris, expenses to summer meeting.....	7.00	
Aug.	8, Secretary's third quarter salary.....	50.00	
	8, Expenses of executive committee to St. Paul... ..	21.95	
	Expense of making exhibit and sending delegate to the meet- ing of the American Pomological Society at Philadel- phia, September 12th, 1883.....		
Sept.	7, A. W. Latham, 51 lbs grapes and material for packing, 10.00		
	8, J. T. Grimes, collecting fruits, material for packing, express charges, &c.....	21.20	
	8, Oliver Gibbs, Jr., expenses to Philadelphia, includ- ing the collecting, forwarding, &c.....	331.34	362.54
Oct.	20, Secretary's fourth quarter salary.....	50.00	
Nov.	12, R. P. Spear, essay on orcharding.....	25.00	
	1884.		
Jan.	15, Treasurer's incidental expenses 1883.....	10.36	
	15, Treasurer's salary for current year.....	25.00	
Total disbursements....			\$1,291.28
Permanent fund on hand.....		\$600.00	
Interest.....		43.78	
Balance in treasury.....		172.29	816.07
			<hr/>
			\$2,107.35

President J. S. Harris presented the following statement of services for the past year, with accompanying bill for time and expenses:

PRESIDENT'S STATEMENT.

As President of the Minnesota State Horticultural Society, I have endeavored to improve every opportunity to advance its interests, increase its membership, and awaken a general interest in the cultivation of fruits, flowers and shrubbery throughout the state, and have held myself in readiness to impart instruction whenever called upon, and during the year have addressed the farmers of McLeod county three times and the Olmsted County Horticultural Society once, and extended my travels over the Southern Minnesota road a distance of over 200 miles.

Five hundred and eighty-one miles of my travel has been done on thousand mile tickets and the balance on a pass kindly sent to me by the Chicago, Milwaukee & St. Paul company. I have been obliged to decline two invitations to address popular meetings, but have promised to do so at some future time.

My expenses have been:—

For railroad tickets.....	\$15.48
Looking for seedlings.....	6.50
Looking up fruit for Pomological meeting.....	4.50
Expenses of Rochester and Glencoe.....	3.50
	<hr/>
	\$29.98

And in addition have given of my time as follows:

Two trips through portions of Houston county	4 days.
In Fillmore county.....	2 "
Olmsted county.....	4 "
Winona county.....	2 "
Martin county.....	8 "
Looking up fruit for Pomological meeting.....	8 "
	<hr/>
	28 "

Also expenses at St. Paul in working before the Legislature ..	\$12.75
Expenses of June meeting.....	7.00
	<hr/>
	29.98
	<hr/>
	\$49.73

Payments received.....	19.75
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Balance.....	\$29.98
For 28 days' time.....	20.02
	<hr/>
	\$50.00

On motion the bill was referred to the Finance Committee, who reported, recommending that an order be drawn for fifty dollars to pay the account, and the report was on motion adopted.

J. C. Plumb, F. G. Gould and Prof. E. D. Porter, were appointed a committee of award on the premium list.

EVENING SESSION.

Tuesday, January 15.

The society met at the room of the Delta Sigma Society in the University building, and the regular program was proceeded with by the reading of the following paper :

TORNADOES.

BY A. W. SIAS, OF ROCHESTER.

Mr. President, Ladies and Gentlemen :

In the winter of 1879, at the suggestion of Secretary C. Y. Lacy, I prepared a paper on the subject of Irish potatoes. Meeting a member soon after who is an expert in potatoe culture, he remarked, " I heard your article on potatoes, and it seems to me it contained more apples than potatoes."

And now, if any close observer should notice more trees than tornadoes in this crude production, I hope it will be attributed more to the heart than to the head.

I have no sympathy for those sentimental people who charge up all the ills that flesh is heir to to a special act of Divine Providence. I do not believe that the Almighty has any particular grudge against Rochester or Olmsted county, but at the same time I do believe that that part of our State where the greatest neglect of Nature's laws is to be found will prove to be the most unsafe place to live. My orchards, buildings, &c., were damaged to the extent of over \$1,000. But if a row of cottonwoods had been set fifteen years ago, four feet apart, directly west of the orchard, it is doubtful whether my loss would be worthy of mention.

Speaking of the damage to the city proper, we are located in the southwestern limits, facing on Cutler street, the most westerly

street in the city. Owing to the peculiar location of this street, and the supposed bearing that a judicious use of forest trees has had on the life and property of the settlers directly east of it, I think it well to go a little into the particulars in regard to the planting on this western border of our city. Beginning as far south as Cutler street is worked, or traveled, we find on the east side E. Whitcomb, and on the west our nearest neighbor, M. J. Hoag, both of these gentlemen have, from their earliest settlement on the hill, invested liberally in both fruit and ornamental trees, and escaped almost unharmed. The next place running north is my own, to which I have already alluded, consisting of two blocks, one on each side of the street. Next is the elegant residence of C. C. Willson, Esq., who owns two blocks on either side. His residence is upon the east side, and is completely surrounded with the most lavish supply of deciduous and evergreen trees to be found on any place in the city, if not in the whole county. Three of the best built barns in the county, costing about \$3,000, on the west side of the street, and directly west of his residence, just beyond his tree protection, were a total wreck. He said to me that he believed his trees saved his house. The next two blocks on either side are owned by non-residents. The one on the east has but a single tree on it, a small oak. Here the tornado closed in close to the ground and gathered strength to take up many large oaks on the next block east, together with the chimneys. Here it was carried high up by the tall oaks completely over the west block and dashed down on to a brick barn below, doing considerable damage. The next blocks on both side are covered with native trees, and there was little or no damage done in the vicinity. The next two blocks have each a house in the native groves and are all right. Next on the west we come to what was the brick residence of James Bucklin. Here there were no trees for many miles west up the Cascade valley, and his house was a total wreck. Adjoining is the residence of W. E. Kennedy, which is well supplied with trees, his house sustained but little or no damage. Then we cross the Cascade Creek and soon strike the land of Hon. O. P. Whitcomb, who was never known to turn the cold shoulder on an honest tree grower. He owns most of the land up to the railroad, and has it well lined with that noble tree known as Ash Leaved Maple. Am sorry to say that many of these valuable trees went down owing to the fact that there was no protection on the west of them. With the exception of Rev. Geo. Ainsle's residence, which was nicely embowered in trees, and sustained but slight injuries, the balance of

the land north to the city limits is owned by non-residents who excuse themselves from planting trees on the ground that tenants will not properly care for them. We would say in justice to these land owners that had they realized the necessity of planting trees as a means of protection to life and property, we believe it would have been promptly and cheerfully done. Non-residents owning large tracts of land destitute of trees, exert an influence on these tornadoes not fully appreciated. Were a man to give me my choice, either to have a 1000 acre tract of land destitute of trees, located southwest of my house and close to it, or allow him to set up a powder magazine near it, I think I should choose the latter. From the aforesaid tract to the worst part of the devastated district, trees were few and far between. Let the *History of Winona and Olmstead County* give the natural result of such neglect :

"On the afternoon of August 21, 1883, the citizens of Rochester and vicinity, observed a peculiar condition of the atmosphere. The air was murky and oppressive. The heavens were overcast by clouds of a dull leaden hue, and apparently there were three strata, but moving in different directions. About three or four o'clock the clouds began to concentrate immediately west of the city, a slight shower of rain passed over, and for a few moments succeeding, the air was still as a tomb. Soon light, fleecy clouds were seen scudding athwart the sky at lightning speed, the great dark mass in the west assumed a greenish cast, the heavens blazed with pale yellow lightning, and soon a roar was heard that caused stern faces to blanch and brave hearts to throb with terror. In a moment the storm was upon us. With a roar like ten thousand demons, it swept down upon the beautiful city. Like a great coiling serpent, darting out a thousand tongues of lightning, with a hiss like the seething roaring Niagara, it wrapped the city in its hideous coils. The crashing of buildings and the despairing shrieks of men, women and children were drowned in its terrible roar. An hour later, the pale moonbeams fell upon two hundred ruined homes, two score of dead, ghastly faces, and the stillness of night was broken by the moans of the wounded and dying. What tongue or pen can half describe this terrible scene of desolation and deaths."

Nature's laws are inexorable, unyielding, and to defy them, or run counter to such laws, shows a weakness, an obstinacy that is open to the highest censure.

The inhabitants of Pompeii who were flourishing in all their glory at the commencement of the Christian era, with a city of 35,000 inhabitants at the foot of Mount Vesuvius, with villas all

the way to the top of the volcano, bade defiance to Nature's laws in the choice of location for their beautiful city. And in consequence on the 24th day of August, A.D., 79, they were buried from twenty to seventy feet deep. And in like manner the people of the beautiful city of Rochester, Minnesota, bade defiance to all blizzards and tornadoes, and, at the same time to Nature's laws, when they located near the head of a large, level, open valley that extends many miles west and southwest up the cascade, with scarcely a tree or shrub to break the wind.

Chompallion, the great African traveler, asks: "Is there any crime against Nature which draws down on man a more terrible curse than that of stripping Mother Earth of her sylvan covering? The hand of men has produced this desert and, I verily believe, every other desert upon the surface of this earth. Earth was Eden once; and our misery is the punishment of our sins against the world of plants. The burning sun of the desert is the angel with the flaming sword who stands between us and Paradise."

Seneca says, "It is good for a man to fortify himself on his weak side." And we say that it is wise and expedient for every household, as well as for every city in the whole land, to fortify itself on its weak side, especially on the west and southwest, from whence came our prevailing winds during the time of these terrible tornadoes.

The late lamented Leonard B. Hodges, the "John A. Warder of this part of the Union," as he has been aptly termed, and Mr. Pearce, another well-known horticulturist, whom we all know how to appreciate, resided for many years near our devastated city. They were both here when I came to the state in '59; and Mr. Hodges was then in the nursery business. Now, let us imagine what might have been the result providing our city fathers, as long ago as '59 had employed one of these noble champions of the "Monarch of the Prairies," the cottonwood, to plant a dozen rows along the western limits of the city, four feet apart each way. Let those who were well-protected by trees at the time of the tornado answer. Right here let me quote from the words of Mr. Hodges, who spoke to us from this very platform less than a year ago, and let us cherish these, the last words to this society, from our acknowledged leader in forestry: "The pioneer farmer out on our oceanic prairies, who surrounds his quarter section, with a broad belt of forest trees, protects not only his own fields and crops from the damaging effects of storms, but to a great extent protects his adjoining neighbor, who, in common with him, enjoys the

wealth he has developed, and he can no more prevent them from the enjoyment thereof than from the benefit of sunlight or rainfall, which are the common wealth of all God's creatures. Hence I take the ground that it is not only eminently proper, but that it is the duty of the state, in every suitable way to aid by appropriate legislation in the development or erection of this sort of common wealth. * * * And if I succeed in stirring up the whole legislative menagerie to a realizing sense of their duty in this behalf, I shall feel that I have not lived in vain." He also said at a horticultural meeting at Rochester, in 1878: "The highly refined, fastidious and aristocratic element of our large towns and cities, unite in [despising their noble tree, the cottonwood. But who cares? It has its own merits, merits that will cause it to be propagated, cherished, nourished and protected by willing hands and loving hearts, until the great interior treeless region of the North American continent shall have been reclaimed and become one of the traditions of the past. When the marble monuments vainly erected to perpetuate the memory of the names of its traducers shall have crumbled into dust; when even the State Horticultural Society has ceased to exist, even then will this monumental tree shed its blessings and its cotton alike upon the just and the unjust. I propose to stand by the cottonwood. Whether planted on a sandbank or a river bottom, in the doorway or in a desert, on the prairie or in the timber, the result is a great, sturdy, healthy forest tree. It is a success, and that's why people plant it. It don't fool away years of precious time getting ready to do something, but is up and coming from the word go. It is emphatically a pioneer tree. This and the white willow will do more to prepare the way for the cultivation of fruit trees than any other agencies I can think of."

We measured a cottonwood last month, planted by R. L. Cotterell, of our county, some twenty years ago, that measured nine feet and two inches in circumference. And a tree standing near the Zumbro Falls mill, in the wrecked district, measured fifteen feet and four inches round. Since the tornado passed over this place we have appreciated this and the white willow as never before. We look upon the seeds of the cottonwood as so many harbingers of mercy wafted on pure snowy wings to a needy people.

In speaking of blizzards, simoons, and like winds, Mr. Hodges says: "These elemental forces are undoubtedly all right and play an important part in the economy of nature. We have only to guard against them when on the rampage, and in doing this, forestry is the prime factor, the central figure in the whole business."

We agree with Mr. Hodges and are of the opinion that gales, blizzards, hurricanes, tornadoes and even cyclones are, or should be, important educators, and are also an actual necessity in the economy of nature.

We quote the following from the address made by President Harris at our county horticultural meeting at Rochester last month: "If twenty years since, or even ten, there had been planted and cared for twenty acres of fast growing timber, such as cottonwood and willows, upon every quarter section of land up the Cascade valley, and in addition, trees had been planted about the farm buildings and along the roadsides, that terrible storm would have passed almost harmlessly over the city."

Now let us compare the tornado at Rochester with some others that have occurred in the United States within the present century. In 1860 there was a tornado made up on the Ohio river; it passed up the stream till it had nearly passed New Albany, Indiana, and then struck into the heavy timber north and northeast, and while it made terrible havoc with the timber, but few houses were blown down and few, if any, lives lost. The extent of the wrecked district was about the same as at Rochester. I was in the wake of it within a few days after it occurred. The great September gale of 1815, is still without a parallel in its extraordinary characteristics of violence and destructiveness. The following graphic description is quoted from *The Great Events of the Greatest Century*: "The most calamitous destruction befell the trees, orchards and forests exhibiting a scene of desolation, the like of which has never before been witnessed in America." *

* * "Far into the interior the tempest swept and raged with unparalleled fury." * * * "The wind suddenly shifting to the southeast, blew a hurricane, the terrible devastation of which covered a column or area of sixty miles in width." * * *

"Fresh water along the seaboard was for a long time, a rarity of price, the wells having generally overflowed and left full of sea water." * * * "When the vast and tremendous tide was sweeping over the land, the spray arising from it was very great over a wide surface of country, extending to the farthestmost of the northern states. It is spoken of as having resembled a driving snow storm."

Perhaps if we could form any just conception of the myriads of insects injurious to vegetation, that this baptism of salt water destroyed, we should get a glimpse at one of the benefits of this unparalleled gale.

A NEW VERSION.

Many Bible students have searched the Scriptures in vain for these words: "He tempers the winds to the shorn lamb." Now, my wish is this, that in some distant day, and the day may not be very distant either, when all prejudice shall have been laid aside in regard to our having written from a nurseryman's standpoint or from purely selfish motives, that some faithless shepherd, who perchance has lost dear lambs for want of judicious tree protection, and may be searching the Bible or elsewhere for the comforting words above quoted, may find the only true version ever published to the world in the *Transactions of the Minnesota State Horticultural Society for 1884*, viz., "He tempers the winds to the shorn lambs, only when modified or filtered through the beautiful foliage or spray of our many noble forest trees."

When nature's laws are so far changed that the mariner can safely navigate the broad, trackless ocean without compass, life-boat or anchor, then, and not till then, will man be safe outside of tree protection.

In conclusion I will say, that in my humble opinion, the cottonwood, *Populus Mamifera*, is the tree of all trees to use for immediate effect against tornadoes, and also the cheapest tree to procure, as the seed and cuttings can be found on most any of our streams or farms, without money and without price. In looking over the devastated district at Rochester I observed this difference between the cottonwood and all other trees, viz: in the case of fruit trees, evergreens etc., the tornado invariably took the largest specimens, while near the Zumbro Falls Mill, where it struck fearfully hard, the large cottonwood alluded to above as measuring over fifteen feet, had no damage done to it except a few limbs broken from the top, and another in the north line of the tornado measured nineteen and one-half feet in circumference. While many cottonwoods of medium size and the largest specimens of other varieties were laid low by this terrible gale, these "Monarchs of the Forest" stood apparently as firm as the everlasting hills, while many of the fine marble tombstones, just beyond in Oakwood Cemetery, were leveled to the dust. When I shall have planted my last tree, and have resigned my spade, as I hope, to more faithful hands, who will be able to do more to save our people from tornadoes, I will crave no prouder monument to mark my last resting place than one of these despised "Monarchs of the Forest."

Discussion on the paper of Mr. Sias was postponed till to-morrow morning, in order to introduce the next paper on

THE WILD FLOWERS OF LAKE PEPIN VALLEY.

BY MISS SARA MANNING, OF LAKE CITY, MINNESOTA.

INTRODUCTION BY THE SECRETARY.

[*Mr. President, Ladies and Gentlemen:* Before the reading of this paper is proceeded with, I desire to say that it has been written for the State Horticultural Society by particular request, and the object in view in asking Miss Manning to furnish it at this time was to make a commencement of a record of the wild flowers and ferns of Minnesota, in our annual report for the year 1884, in the hope that other botanists, after reading this paper, may supply any omissions in it, of varieties they may find anywhere in this State, so that in time we may have in the reports of this society a complete botanical survey of Minnesota in this department. Its interest and value to botanists and horticulturists will be apparent without any remark of mine.

I also wish to say that, while Miss Manning, in order to bring her paper within the usual limits, has very properly omitted the botanical names of most of the varieties, she has kindly offered to furnish a catalogue, and it will be printed in connection with the paper, for reference.]

Miss Manning then read her paper as follows :

During the walks and drives of two pleasant seasons, I have studied the wild flowers of our beautiful valley. Without attempting a scientific arrangement, some idea of them may be given, though not nearly all can receive even a passing notice.

No doubt it would be more proper to consider them by families, but I have chosen to divide the valley, which lies partly in Wisconsin and partly in Minnesota, into several regions and mention the flowers of each without regard to their relationships.

It is a consoling thought to those interested in botany that many of our precipitous bluff-sides and deep ravines can never be cultivated. Here many flowers and ferns will be allowed to grow unmolested by the "westward march of civilization," before which many prairie species disappear.

The more delicate species grow on these bluff-sides, which have a northern exposure. Just at their base in early spring the Purple Anemone blossoms, a daring little pioneer that comes even while here and there the snow still lingers. It is shielded

by a furry involucre and blossoms close to the ground, but afterwards grows taller and is surrounded by the leaves which did not at first appear. Soon after, up the sides, we find the Blood-root wrapped in its sheltering leaf, the Hepatica, forcing its delicate tinted blossoms through last year's fallen leaves; Wind-flower, Rue-Anemone, Baneberry, with graceful Columbine and Feathery Meadow-Rue growing about rocks and roots of trees. Quite a rare species of Virgin's-Bower (*Clematis verticillaris*) climbs over shrubs and small trees, hanging purple bells from their branches. Beautiful pink-tipped Dicentra, white Wake-Robin, which soon changes to rose-color, and Canada Violet are among early flowers.

Later, Two-leaved Solomon's Seal and Mitrewort send up little white blossoms from their bed of moss. Beneath two soft velvety leaves, the queer red-brown flower of Wild Ginger hangs its head. In moist places are Blue Cohosh, Mandrake, and Wild Sarsaparilla, and here Jack-in-the-Pulpit preaches a silent sermon. Farther up are fern-like sprays of False Solomon's Seal and Bellwort, its drooping flower of pale yellow, half hidden by the leaves. In some little nooks the ground is carpeted with the shining leaves of Wintergreen, one species (*Pyrola secunda*) with its one-sided racemes, reminding us of the Lily of the Valley. Very common is the Large Yellow Lady's Slipper and Calopogon, sometimes called Grass Pink because of its grass-like leaves. In a few places is the Showy Lady's Slipper, most beautiful of the genus, having two, sometimes three, flowers on a stem. Last of all are Five-flowered and Fringed Gentians which open their blue blossoms late in October; with them is that strange species which always remains closed.

To ferns and mosses more than to flowers the bluff-sides owe their beauty. Trailing over fallen tree trunks and draping rough rocks with green luxuriance as though nature were trying to cover all unsightly objects with lovely living forms. The little rock-loving brake (*Pellaea atropurpurea*) with dark green fronds in contrast with the brown stems completely covers the shaded side of rocks. More delicate (*Pellaea gracilis*) with fronds of lighter green grows on mossy ledges, in the crevices of which Walking Leaf is occasionally found. On the ground the long slender fronds of *Cystopteris* tangle themselves with everything near, and the beautiful Maiden-hair grows in all possible places. Then there are the Shield Ferns and tall Spleenworts, with here and there a Moonwort Fern.

At the summit of the bluffs the little evergreen Polypodys stand erect among the moss.

With the mixed undergrowth at the top of the bluffs are Ostrich Ferns Common Brake and Flowering Ferns. Contrasting with their dark green fronds are the bright flowers of Wild Phlox, Greek Valerian, Red Lily and Painted Cup, with brilliant bracts, which make it the most showy of our wild flowers.

All down the sunny southern slopes are mats of Rock Cress, Long-flowered Puccoon, Spiderwort, in many shades of purple and blue, Zygedene, with wax-like flowers, and sprays of dainty little Harebell. Many of the prairie flowers grow also on these southern slopes.

Down in some cool, shaded ravines between the bluffs, wild vines grow unchecked. Bittersweet, Woodbine and glossy-leaved Green-brier climb the trees and hang festoons from their branches, Poison Ivy clings by its rootlets to the rocks, Pipe Vine covers shrubs with its broad leaves and bright flowers, and slender Wild Yam twines about the bushes. Here, also, are Cornell, Arrow-wood, Mountain Maple, Strawberry Bush, Honeysuckle and many other beautiful shrubs.

Out in the oak barrens the Rose Family is well represented by its Strawberries, Cinquefoils, Spireas, Avens, Brambles and Wild Roses. With them are four species of blue Violets, Wild Geranium, Wood Sorrel, Cleavers, Polygalas, Starry Campion, etc. A common shrub is Jersey Tea, with clusters of small white flowers, the petals of which are shaped like tiny soup-ladles. The Mustard, Parsley Figwort and Mint Families add many species to the flowers of the oak wood. Where they border the shores of the lake, the trees are in many places covered with the thick foliage of Wild Grape and Moonseed. On the banks are Milk Vetch, Wild Licorice, False Indigo and other species common to river banks.

The Pulse and Composite Families are especially characteristic of the prairie. To the former belong Wild Beans, Lupines, Vetches, Clovers, etc. Two especially pretty plants of this family are (*Amorpha canescens*) which has rich dark purple petals and golden exerted stamens, and (*Petalostemon villosus*) with rose-colored flowers. Of the Composite Family the number is legion. Through the late summer and autumn, our prairies are brilliant with a bewildering array of Sunflowers, Cone-flowers, Blazing-Stars, Fleabanes, Golden-rods, Asters, etc. To this family belongs the odd Compass Plant, which might be very convenient as its leaves point north and south. Tall Azure Larkspur, Puccoon, Butterfly Weed,

Flowering Spurge, and *Oxybaphus*, which like its relative the garden Four-o'clock closes in the sunshine, are common prairie species. On the sandy soil of the Wisconsin side, Dwarf Wild Rose covers whole hill-sides, making a beautiful sight in the time of flowers and filling the air with fragrance. An especially conspicuous plant of that side is *Pentstemon grandiflorus* with its light green leaves and long racemes of bright pink flowers.

Though each side of Lake Pepin has many species not found on the other, in using only common names it is difficult to make distinctions.

Wayside weeds we have without number, which though scornfully called homely weeds, are often very interesting to study.

As we follow the windings of a little creek, where in the spring-time Yellow Violets and pale pink Waterleaf grew, and the banks were golden with Buttercups and Cowslips, we find it fringed with a tangled growth. Virgin's-Bower trims trees and shrubs with its white blossoms, Bineweed and Wild Cucumber tangle their long vines with tall Touch-me-not, Indian Hemp and Swamp Milkweed. In grassy places Solomon's Seal swings its row of tiny bells over the water. Green striped Grass of Parnassus and Purple Polygala grow near. Ellisea trails its minute flowers and pretty leaves on the ground. On the wet banks are blue spikes of Tall Bellflower and Great Lobelia. Floating upon the water where it flows softly are green leaves and yellow blossoms of Monkey-flower (*Mimulus Jamesii*).

Where the creek flows into a pond are crimson and rose-colored spikes of Water Smartweed, White Water Lilies with floating leaves, and Yellow with leaves erect. In bordering marshes is a miscellaneous mixture of Blue Flags, Cat-tails, Arrow-heads, Water-Plantain, etc. The most showy marsh plants are Pickerelweed, which has spikes of violet flowers, and Cardinal Lobelia.

The little white and yellow Lady's Slippers are sometimes found in bogs, though both are rare.

Though this essay seems a general tangle of flowers and vines, there are many species, some of them little favorites, and even whole families, for which there is no room. The catalogue to be printed with it contains about five hundred Phænogamous plants and ferns found in the Valley of Lake Pepin. Some one learned in wild-flower lore might give a more complete list. The knowledge of these and an herbarium containing half the number are results of last summer's study.

It is sometimes a surprise that Botany is not more studied, not only because of its intimate relation to Horticulture, but also for the pleasure it affords. No other science can be so easily studied, and none with more pleasing results. It is interesting in all seasons—from early spring, when in our first walks we find the tiny ferns unrolling and tender leaves just breaking through the sod ; through the summer, with its wealth of bright blossoms ; to the autumn, when there is much to learn of fruit and seeds. Even in the snow-bound days of winter we may study the arrangement of branches on different shrubs and trees. Then more than ever each tree seems to have an individual character, as we see it outlined against the sky, stripped of its summer foliage.

Leave dry text-books and go out and see "*How Plants Behave.*" Almost unconsciously too, we find ourselves studying Entomology and wondering why particular species are always visited by certain insects. By careful watching we may learn their secrets.

It is a restful, helpful study, making every-day life brighter. One need never be lonely out among the flowers where the bright-winged insects come and go, where on all sides—

" Whether we look or whether we listen,
We hear life murmur or see it glisten."

CATALOGUE.

RANUNCULACEÆ.

(CROWFOOT FAMILY.)

Clematis

1. verticillaris, DC.; *Virgin's Bower*.
2. Virginiana, L.; *Common Virgin's Bower*.

Anemone

3. patens, L.; *Pasque-flower*.
4. cylindrica, Gray; *Long-fruited Anemone*.
5. Virginiana, L.; *Virginian Anemone*.
6. Pennsylvanica, L.; *Pennsylvanica Anemone*.
7. nemorosa, L.; *Wind-flower*.

Hepatica

8. triloba, Chaix.; *Round-lobed Hepatica*.
9. acutiloba, DC.; *Acute-lobed Hepatica*.

Thalictrum

10. anemonoides, Michx.; *Rue Anemone*.
11. dioicum, L., *Early Meadow Rue*.
12. purpurascens, L.; *Purplish Meadow Rue*.
13. Cornuti, L.; *Tall Meadow Rue*.

Ranunculus

14. rhomboideus, Goldie; *Early Crowfoot*.
15. abortivus, L.; *Small-flowered Crowfoot*.
16. sceleratus, L.; *Cursed Crowfoot*.
17. recurvatus, Poir.; *Hooked Crowfoot*.
18. Pennsylvanicus, L.; *Bristly Crowfoot*.
19. acris, L.; *Buttercups*.

Caltha

20. palustris, L.; *Marsh Marigold, Cowslip*.

Aquilegia

21. *Canadensis*, L.; *Wild Columbine*.

Delphinium

22. *azureum*, Michx.; *Azure Larkspur*.

Actæa

23. *spicata*, L., var. *rubra*, Mx.; *Red Baneberry*.
 24. *alba*, Bigel.; *White Baneberry*.

MENISPERMACEÆ.

(MOONSEED FAMILY.)

Menispermum

25. *Canadense*, L., *Moonseed*.

BERBERIDACEÆ.

(BARBERRY FAMILY.)

Caulophyllum

26. *thalictroides*, Michx.; *Blue Cohosh*.

Podophyllum

27. *peltatum*, L.; *Mandrake*, *May Apple*.

NYMPHÆACEÆ.

(WATER-LILY FAMILY.)

Nymphæa

28. *tuberosa*, Paine; *White Water-Lily*.

Nuphar

29. *advena*, Aiton; *Yellow Pond-Lily*.

PAPAVERACEÆ.

(POPPY FAMILY.)

Sanguinaria

30. *Canadensis*, L.; *Blood-root*.

FUMARIACEÆ.

(FUMATORY FAMILY.)

Dicentra

31. *Cucullaria*, DC.; *Dutchman's Breeches*.

Corydalis

32. aurea, Willd.; *Golden Corydalis*.

CRUCIFERÆ.

(MUSTARD FAMILY.)

Nasturtium

33. officinale, R. Br.; *True Water Cress*.
34. sinuatum, Nutt.; *Water Cress*.

Cardamine

35. hirsuta, L.; *Small Bitter Cress*.

Arabis

36. lyrata, L.; *Rock Cress*.
37. lævigata, DC.; *Smooth Rock Cress*.
38. Canadensis, L.; *Sickle-pod*.
39. perfoliata, Lam.; *Tower Mustard*.

Erysimum

40. cheiranthoides, L.; *Worm-seed Mustard*.

Sisymbrium

41. officinale, Scop.; *Hedge Mustard*.

Brassica

42. alba, Gray; *White Mustard*.
43. nigra, Gray; *Black Mustard*.

Draba

44. Caroliniana, Walt.; *Whitlow Grass*.

Alyssum

45. calycinum, L.; *Alyssum*.

Capsella

46. Bursa-pastoris, Mœnch.; *Shepherd's Purse*.

Lepidium

47. Virginicum, L.; *Wild Peppergrass*.

CAPPARIDACEÆ.

(CAPER FAMILY.)

Polanisia

48. graveolens, Raf.; *Polanisia*.

VIOLACEÆ.

(VIOLET FAMILY.)

Viola

- 49. cucullata, Aiton; *Common Blue Violet*.
- 50. cucullata, Ait., var. palmata, Gr.; *Hand-leaf Violet*.
- 51. sagittata, Aiton; *Arrow-leaved Violet*.
- 52. delphinifolia, Nutt; *Larkspur Violet*.
- 53. pedata, L.; *Bird-foot Violet*.
- 54. canina, L., var. sylvestris, Reg.; *Dog Violet*.
- 55. Canadensis, L.; *Canada Violet*.
- 56. pubescens, Ait.; *Downy Yellow Violet*.

CISTACEÆ.

(ROCK-ROSE FAMILY.)

Helianthemum

- 57. Canadense, Michx.; *Frost-weed*.

Hudsonia

- 58. ericoides, L.; *Hudsonia*.

HYPERICACEÆ.

(ST. JOHN'S-WORT FAMILY.)

Hypericum

- 59. corymbosum, Muhl.; *St. John's-wort*.
- 60. mutilum, L.; *Slender St. John's-wort*.
- 61. pyramidatum, Ait.; *Great St. John's-wort*.

CARYOPHYLLACEÆ.

(PINK FAMILY.)

Saponaria

- 62. officinalis, L.; *Common Soapwort*.
- 63. vulgaris, Host.; *Cow Herb*.

Silene

- 64. stellata, Ait.; *Starry Campion*.
- 65. antirrhina, L.; *Sleepy Catchfly*.
- 66. noctiflora, L.; *Night-flowering Catchfly*.

Lychins

67. *Githago*, Lam.; *Corn Cockle*.

Cerastium

68. *vulgatum*, L.; *Mouse-ear Chickweed*.

Mollugo

69. *verticillata*, L.; *Carpet-weed*.

MALVACEÆ.

(MALLOW FAMILY.)

Malva

70. *rotundifolia*, L.; *Common Mallow*.
71. *sylvestris*, L.; *High Mallow*.
72. *crispa*, Gray; *Curled Mallow*.

Abutilon

73. *Avicennæ* Gærtri.; *Velvet Leaf*.

TILIACEÆ.

(LINDEN FAMILY.)

Tilia

74. *Americana*, L.; *Linden*, *Basswood*.

LINACEÆ.

(FLAX FAMILY.)

Linum

75. *sulcatum*, Riddell; *Wild Flax*.

GERANIACEÆ.

(GERANIUM FAMILY.)

Geranium

76. *maculatum*, L.; *Wild Cranesbill*.

Impatiens

77. *pallida*, Nutt; *Pale Touch-me-not*.
78. *fulva*, Nutt; *Spotted Touch-me-not*.

Oxalis

79. *violacea*, L.; *Violet Wood-Sorrel*.
80. *stricta*, L.; *Yellow Wood-Sorrel*.

RUTACEÆ.

(RUE FAMILY.)

Zanthoxylum

81. *Americanum*, Mill.; *Prickly Ash*.

ANACARDIACEÆ.

(CASHEW FAMILY.)

Rhus

82. *glabra*, L.; *Smooth Sumach*.
83. *copallina*, L.; *Dwarf Sumach*.
84. *Toxicodendron*, L.; *Poison Ivy*.

VITACEÆ.

(VINE FAMILY.)

Vitis

85. *Labrusca*, L.; *Northern Fox-Grave*.
86. *cordifolia*, Michx.; *Frost Grape*.

Ampelopsis

87. *quinquefolia*, Michx.; *Virginian Creeper*.

RHAMNACEÆ.

(BUCKTHORN FAMILY.)

Ceanothus

88. *Americanus*, L.; *New Jersey Tea*.

CELASTRACEÆ.

(STAFF-TREE FAMILY.)

Celastrus

89. *scandens*, L.; *Climbing Bitter-sweet*.

Euonymus

90. *Americanus*, L.; *Strawberry Bush*.

SAPINDACEÆ.

(SOAPBERRY FAMILY.)

Staphylea

91. *trifolia*, L.; *American Bladder-nut*.

Acre

- 92. *Pennsylvanicum*, L.; *Striped Maple*.
- 93. *spicatum*, Lam.; *Mountain Maple*.
- 94. *saccharinum*, Wang.; *Sugar or Rock Maple*.
- 95. *dasycarpum*, Ehrhart; *Silver Maple*.

Negundo

- 96. *'aceroides*, Mœench.; *Ash-leaved Maple*.

POLYGALACEÆ.

(MILKWORT FAMILY.)

Polygala

- 97. *polygama*, Walt.; *Polygala*.
- 98. *sanguinea*, L.; *Purple Polygala*.
- 99. *Senega*, L.; *Seneca Snakeroot*.

LEGUMINOSÆ.

(PULSE FAMILY.)

Lupinus

- 100. *perennis*, L.; *Wild Lupine*.

Trifolium

- 101. *pratense*, L.; *Red Clover*.
- 102. *repense*, L.; *White Clover*.
- 103. *procumbens* L.; *Low Hop-Clover*.

Melilotus

- 104. *alba*, Lam.; *Sweet Clover*.

Petalostemon

- 105. *violaceus*, Michx.; *Prairie Clover*.
- 106. *candidus*, Michx.; *Prairie Clover*.
- 107. *villosus*, Nutt.; *Prairie Clover*.

Amorpha

- 108. *fruticosa*, L.; *False Indigo*.
- 109. *canescens*, Nutt.; *Lead-Plant*.

Astragalus

- 110. *Canadensis*, L.; *Milk-Vetch*.
- 111. *Cooperi*, Gray; *Milk-Vetch*.

Glycyrrhiza

- 112. *lepidota*, Nutt.; *Wild Licorice*.

Desmodium

- 113. *acuminatum*, DC.; *Tick-Trefoil*.
- 114. *Canadense*, DC.; *Tick-Trefoil*.
- 115. *canescens*, DC.; *Tick-Trefoil*.

Lespedeza

- 116. *hirta*, Ell.; *Bush Clover*.

Vicia

- 117. *sativa*, L.; *Common Vetch*.
- 118. *Caroliniana*, Walt.; *Pale Vetch*.
- 119. *Americana*, Muhl.; *Purple Vetch*.

Lathyrus

- 120. *venosus*, Muhl.; *Vetchling*.
- 121. *ochroleucus*, Hook.; *Indian Pea*.

Phaseolus

- 122. *pauciflorus*, Benth.; *Kidney Bean*.

Baptisia

- 123. *villosus*, Ell.; *Wild Indigo*.
- 124. *leucantha*, Torr. & Gr.; *Wild Indigo*.
- 125. *leucophæa*, Nutt.; *Wild Indigo*.

Cassia

- 126. *Chamæcrista*, L.; *Partridge Pea*.

ROSACEÆ.

(ROSE FAMILY.)

Prunus

- 127. *Americana*, Marshall; *Wild Plum*.
- 128. *pumila*, L.; *Dwarf Cherry*.
- 129. *Virginiana*, L.; *Choke-Cherry*.
- 130. *serotina*, Ehrh.; *Wild Black Cherry*.

Spiræa

- 131. *opulifolia*, L.; *Nine Bark*.
- 132. *salicifolia*, L.; *Common Meadow Sweet*.

Agrimonia

- 133. *Eupatoria*, L.; *Common Agrimony*.

Geum

- 134. *album*, Gmelin; *White Geum*.
- 135. *strictum*, Aiton; *Avens*.
- 136. *rivale*, L.; *Purple Avens*.

Potentilla

- 137. *Norvegica*, L.; *Cinquefoil*.
- 138. *paradoxa*, Nutt.; *Cinquefoil*.
- 139. *Canadensis*, L.; *Common Cinquefoil*.
- 140. *Canadensis*, L., var. *simplex*, T. & Gr.; *Cinquefoil*.
- 141. *arguta*, Pursh.; *Stout Cinquefoil*.

Fragaria

- 142. *Virginiana*, Ehrh.; *Wild Strawberry*.
- 143. *Vesca*, L.; *Wild Strawberry*.

Rubus

- 144. *triflorus*, Richardson; *Dwarf Raspberry*.
- 145. *strigosus*, Michx.; *Wild Red Raspberry*.
- 146. *occidentalis*, L.; *Black Raspberry*.
- 147. *villosus*, Aiton; *High Blackberry*.
- 148. *Canadensis*, L.; *Low Blackberry*.

Rosa

- 149. *lucida*, Ehrh.; *Dwarf Wild-Rose*.

Cratægus

- 150. *tomentosa*, L.; *Black or Pear Thorn*.
- 151. *Crus-galli*, L.; *Cockspur Thorn*.

Pyrus

- 152. *coronaria*, L.; *American Crab Apple*.
- 153. *arbutifolia*, L.; *Choke-berry*.

Amelanchier

- 154. *Canadensis*, T. & Gr., var. *Botryapium*, Gr.; *June-berry*.

SAXIFRAGACEÆ.

(SAXIFRAGE FAMILY.)

Ribes

- 155. *Cynosbati*, L.; *Wild Gooseberry*.
- 156. *floridum*, L.; *Wild Black Currant*.

Parnassia

- 157. *Caroliniana*, Michx.; *Grass of Parnassus*.

Saxifraga

- 158. *Pennsylvanica*, L.; *Swamp Saxifrage*.

Heuchera

- 159. *Americana*, L., *Common Alum-root*.

Mitella

- 160. *diphylla*, L.; *Mitrewort*.

CRASSULACEÆ.

(ORPINE FAMILY.)

Penthorum

161. *sedoides*, L., *Ditch Stone-crop*.

ONAGRACEÆ.

(EVENING PRIMROSE FAMILY.)

Circeæa

162. *Lutetiana*, L.; *Enchanter's Nightshade*.

Gaura

163. *biennis*, L.; *Gaura*.

Epilobium

164. *coloratum*, Muhl.; *Willow-herb*.

Oenothera

165. *biennis*, L.; *Common Evening Primrose*.

166. *rhombipetala*, Nutt.; *Evening Primrose*.

Ludwigia

167. *polycarpa*, short & Peter; *False Loosestrife*.

LYTHRACEÆ.

(LOOSESTRIFE FAMILY.)

Lythrum

168. *alatum*, Pursh.; *Loosestrife*.

CUCURBITACEÆ.

(GOURD FAMILY.)

Sicyos

169. *angulatus*, L.; *One-seeded Star Cucumber*.

UMBELLIFERÆ.

(PARSLEY FAMILY.)

Sanicula

170. *Marilandica*, L., *Sanicle*.

Eryngium

171. *yuccæfolium*, Michx.; *Rattlesnake Muster*.

Daucus

172. *Carota*, L.; *Common Carrot*.

Heracleum

173. *lanatum*, Michx.; *Cow-Parsnip*.

Pastinaca

174. *sativa*, L.; *Common Parsnip*.

Archangelica

175. *hirsuta*, Torr & Gray; *Archangelica*.
176. *atropurpurea*, Hoffm.; *Great Angelica*.

Æthusa

177. *Eynapium*, L.; *Fool's Parsley*.

Thaspium

178. *aureum*, Nutt.; *Meadow-Parsnip*.
179. *trifoliatum*, Gray; *Meadow Parsnip*.

Zizia

180. *integerrima*, DC.; *Zizia*.

Cicuta

181. *maculata*, L.; *Water-Hemlock*.

Sium

182. *lineare*, Michx.; *Water-Parsnip*.

Cryptotaenia

183. *Canadensis*, DC.; *Honewort*.

Osmorrhiza

184. *longistylis*, DC.; *Smoother Sweet-Cicely*.
185. *brevistylis*, DC.; *Hairy Sweet-Cicely*.

ARALIACEÆ.

(GINSENG FAMILY.)

Aralia

186. *racemosa*, L.; *Spikenard*.
187. *nudicaulis*, L.; *Wild Sarsaparilla*.
188. *trifolia*, Gray; *Dwarf Ginseng*.

CORNACEÆ.

(DOGWOOD FAMILY.)

Cornus

189. *Canadensis*, L.; *Dwarf Cornell*.

190. sericea, L.; *Silky Cornell, Kinnikinnick.*
 191. stolonifera, Michx.; *Red-osier Dogwood.*

CAPRIFOLIACEÆ.

(HONEYSUCKLE FAMILY.)

Symphoricarpus

192. racemosus, Michx.; *Snowberry.*
 193. racemosus, Mx., var. pauciflorus, Robb.; *Snowberry.*
 194. vulgaris, Michx.; *Indian Currant.*

Lonicera

195. grata, Ait.; *American Woodbine.*
 196. parviflora, Lam.; *Small Honeysuckle.*

Diervilla

197. trifida, Mœnch.; *Bush Honeysuckle.*

Triostemon

198. perfoliatum, L.; *Fever-wort.*

Sambucus

199. Canadensis, L.; *Common Elder.*

Viburnum

200. dentatum, L.; *Arrow-wood.*
 201. Opulus, L.; *Cranberry-tree.*

RUBIACEÆ.

(MADDER FAMILY.)

Galium

202. trifidum, L.; *Small Bedstraw.*
 203. triflorum, Michx.; *Sweet-scented Bedstraw.*
 204. boreale, L.; *Northern Bedstraw.*

Houstonia

205. purpurea, L., var. longifolia, Gr.; *Houstonia.*

VALERIANACEÆ.

(VALERIAN FAMILY.)

Valeriana

206. edulis, Nutt.; *Valerian.*

Fedia

207. *Fagopyrum*, T. & Gray.; *Lamb Lettuce*.

DIPSACEÆ.

(TEASEL FAMILY.)

Dipsacus

208. *sylvestris*, Mill.; *Wild Teasel*.

COMPOSITÆ.

(COMPOSITE FAMILY.)

Vernonia

209. *fasciculata*, Michx.; *Iron Weed*.

Liatris

210. *squarrosa*, Willd.; *Blazing-star*.
 211. *cylindracea*, Michx.; *Blazing-star*.
 212. *spicata*, Willd.; *Blazing-star*.
 213. *pycnostachya*, Michx.; *Blazing-star*.

Eupatorium

214. *ageratoides*, L.; *White Snake-root*.
 215. *perfoliatum*, L.; *Thoroughwort*.
 216. *purpureum*, L.; *Joe-Pye Weed*.

Tussilago

217. *Farfara*, L.: *Coltsfoot*.

Aster

218. *cordifolius*, L.; *Heart-leaved Aster*.
 229. *dumosus*, L.; *Aster*.
 220. *multiflorus*, Ait; *Many-flowered Aster*.
 221. *Novæ-Anglia*, L.; *New England Aster*.
 222. *ptarmicoides*, T. & Gr.; *Aster*.
 223. *sagittifolius*, Willd.; *Arrow-leaved Aster*.
 224. *sericeus*, Vent.; *Silky Aster*.
 225. *simplex*, Willd.; *Pale Aster*.
 223. *Tradescanti*, L.; *Aster*.

Erigeron

227. *bellidifolium*, Muhl.; *Robin's Plantain*.
 228. *Philadelphicum*, L.; *Common Fleabane*.
 229. *annuum*, Pers.; *Daisy Fleabane*.

Diplopappus

230. *umbellatus*, Torr. & Gray.; *Double-bristled Aster*.

Boltonia

231. *glastifolia*, L'Her.; *Boltonia*.

Solidago

232. *cæsia*, L.; *Golden-rod*.
 233. *lanceolata*, L.; *Golden-rod*,
 234. *latifolia*, L.; *Golden-rod*.
 235. *nemoralis*, Ait.; *Golden-rod*.
 236. *speciosa*, Nutt.; *Golden-rod*.
 237. *serotina*, Ait.; *Golden-rod*.
 238. *stricta*, Ait.; *Golden-rod*

Silphium

239. *laciniatum*, L.; *Rosin-weed*, *Compass Plant*.
 240. *perfoliatum*, L.; *Cup Plant*.

Iva

241. *xanthiifolia*, Nutt.; *Marsh Elder*.

Ambrosia

242. *trifida*, L.; *Great Ragweed*.
 243. *artemisiæfolia*, L.; *Roman Wormwood*..

Xanthium

244. *strumarium*, L.; *Common Cocklebur*.

Rudbeckia

245. *hirta*, L.; *Cone-flower*.
 246. *laciniata*,; *Cone-flower*.

Helianthus

247. *annuus*, L.; *Common Sunflower*.
 248. *giganteus*, L.; *Sunflower*.
 249. *grosse-serratus*, Martins.; *Sunflower*.
 250. *occidentalis*, Riddell.; *Sunflower*.
 251. *rigidus*, Desf.; *Sunflower*.
 252. *strumosus*, L.; *Sunflower*.
 253. *tracheliifolius*, Willd.; *Sunflower*.

Coreopsis

254. *palmata*, Nutt.; *Tickseed*.

Bidens

255. *frondosa*, L.; *Common Beggar-ticks*.
 256. *cernua*, L.; *Smaller Bur-Marigold*.

Helenium

257. *autumnale*, L ; *Sneeze-weed*.

Maruta

258. *Cotula*, DC.; *May-weed*.

Achillea

259. *Millefolium*, L.; *Common Yarrow*.

Tanacetum

260. *vulgare*, L.; *Tansy*.

Artemisia

261. *caudata*, Michx.; *Wormwood*.
262. *Ludoviciana*, Nutt.; *Western Mugwort*.
263. *frigida*, Willd.; *Wormwood*.

Gnaphalium

264. *polycephalum*, Michx.; *Common Everlasting*.

Antennaria

265. *plantaginifolia*, Hook.; *Plantain-leaved Everlasting*.

Erechthites

266. *hieracifolia*, Raf.; *Fireweed*.

Cacalia

267. *reniformis*,^f Muhl.; *Great Indian Plantain*.

Senecio

268. *palustris*, Hook.; *Groundsell*.
269. *aureus*, L.; *Golden Ragwort*.

Cirsium

270. *lanceolatum*, Scop.; *Common Thistle*.
271. *altissimum*, Spreng.; *Tall Thistle*.
272. *muticum*, Michx.; *Swamp Thistle*.

Lappa

273. *officinalis*, Allioni.; *Burdock*.

Cynthia

274. *Virginica*, Don.; *Cynthia*.

Troximon

275. *cuspidatum*, Pursh.; *Troximon*.

Hieracium

276. *Canadense*, Michx.; *Canada Hawkweed*.

Nabalus

277. *albus*, Hook.; *White Lettuce*.

Taraxacum

278. *Dens-leonis*, Desf.; *Dandelion*.

Lactuca

279. *Canadensis*, L.; *Wild Lettuce*.

Sonchus

280. *asper*, Vill.; *Spiny-leaved Sow-Thistle*

LOBELIACEÆ.

(LOBELIA FAMILY.)

Lobelia

281. *cardinalis*, L.; *Cardinal-flower*.
282. *syphilitica*, L.; *Great Lobelia*.
283. *spicata*, Lam.; *Lobelia*.

CAMPANULACEÆ.

(CAMPANULA FAMILY.)

Campanula

284. *rotundifolia*, L.; *Harebell*.
285. *Americana*, L.; *Tall Bellflower*.

ERICACEÆ.

(HEATH FAMILY.)

Vaccinium

286. *Pennsylvanicum*, Lam.; *Dwarf Blueberry*.

Arctostaphylos

287. *Uva-ursi*, Spreng.; *Bearberry*.

Gaultheria

288. *procumbens*, L.; *Creeping Wintergreen*.

Pyrola

289. *elliptica*, Nutt.; *Shin-leaf*.
290. *secunda*, L.; *Wintergreen*.

Chimaphila

291. *umbellata*, Nutt.; *Prince's Pine*

AQUIFOLIACEÆ.

(HOLLY FAMILY.)

Ilex

292. *verticillata*, Gray.; *Black Alder*.

Nemopanthes

293. *Canadensis*, DC.; *Mountain Holly*.

PLANTAGINACEÆ.

(PLANTAIN FAMILY.)

Plantago

294. major, L.; *Common Plantain*.

PRIMULACEÆ.

(PRIMROSE FAMILY.)

Lysimachia

295. stricta, Ait.; *Loosestrife*.
296. ciliata, L.; *Loosestrife*.

LENTIBULACEÆ.

(BLADDERWORT FAMILY.)

Utricularia

297. vulgaris, L.; *Common Bladderwort*.

OROBANCHACEÆ.

(BROOM-RAPE FAMILY.)

Aphyllon

298. uniflorum, T. & Gr.; *One-flowered Cancer-root*.

SCROPNULARIACEÆ.

(FIGWORT FAMILY.)

Verbascum

299. Thapsus, L.; *Common Mullein*.
300. Blattaria, L.; *Moth Mullein*.

Linaria

301. vulgaris, Miller; *Toad-Flax*.

Scrophularia

302. nodosa, L.; *Figwort*.

Pentstemon

303. grandiflorus, Fraser; *Beard-tongue*.

Mimulus

304. ringens, L.; *Monkey-flower*.
305. Jamesii, Torr.; *Monkey-flower*.

Gratiola

306. *Virginiana*, L.; *Hedge-Hyssop*.

Veronica

307. *Virginica*, L.; *Culver's-root*.
 308. *Americana*, Schwein; *American Brooklime*.

Gerardia

309. *purpurea*, L.; *Purple Gerardia*.
 310. *aspera*, Dougl.; *Gerardia*.
 311. *pedicularia*, L.; *Gerardia*.

Castilleia

312. *coccinea*, Spreng.; *Scarlet Painted-Cup*.
 313. *sessiliflora*, Pursh.; *Painted-Cup*.

Pedicularis

314. *Canadensis*, L.; *Common Lousewort*.

VERBENACEÆ.

(VERVAIN FAMILY.)

Verbena

315. *angustifolia*, Michx.; *Vervain*.
 316. *hastata*, L.; *Blue Vervain*.
 317. *urticifolia*, L.; *White Vervain*.
 318. *stricta*, Vent.; *Hoary Vervain*.
 319. *bracteosa*, Michx.; *Vervain*.

Phyrma

320. *Leptostachya*, L.; *Lopseed*.

LABIATÆ.

(MINT FAMILY.)

Teucrium

321. *Canadense*, L.; *Wood Sage*.

Mentha

322. *Canadensis*, L.; *Wild Mint*.

Lycopus

323. *Virginicus*, L.; *Bugle-weed*.
 324. *Europæus*, L.; var *sinuatus*, Gr.; *Water Horehound*.

Pycnanthemum

325. *lanceolatum*, Pursh.; *Mountain Mint*.

Hedeoma

326. *pulegioides*, Peus., *American Pennyroyal*.
 327. *hispida*, Pursh.: *Mock Pennyroyal*.

Monarda

328. *fistulosa*, L.; *Wild Bergamot*.
 329. *punctata*, L.; *Horse-Mint*.

Lophanthus

330. *scrophulariæfolius*, Benth.; *Giant Hyssop*.

Nepeta

331. *Cataria*, L.; *Catnip*.
 332. *Glechoma*, Benth.; *Ground Ivy*.

Physostegia

333. *Virginiana*, Benth.; *False Dragon-head*.

Scutellaria

334. *parvula* Michx.; *Scullcap*.
 335. *galericulata*, L.; *Scullcap*.
 336. *lateriflora*, L.; *Mad-dog Scullcap*.

Stachys

337. *palustris*, L.; *Hedge-Nettle*.

Leonurus

338. *Cardiaca*, L.; *Motherwort*.

•BORRAGINACEÆ.

(BORAGE FAMILY.)

Lithospermum

339. *hirtum*, Lehm.; *Hairy Puccoon*.
 340. *canescens*, Lehm.; *Hoary Puccoon*.
 341. *longiflorum*, Spreng.; *Long-flowered Puccoon*.

Echinosperrum

342. *Lappula*, Lehm.; *Stickseed*.
 343. *Redowskii*, Lehm.; *Stickseed*.

Cynoglossum

344. *officinale*, L.; *Hounds-Tongue*.

HYDROPHYLLACEÆ.

(WATERLEAF FAMILY.)

Hydrophyllum

345. *Virginicum*, L.; *Waterleaf*.

Ellisia

346. *Nyctelea*, L.; *Ellisia*.

POLEMONIACEÆ.

(POLEMONIUM FAMILY.)

Polemonium

347. *reptans*, L.; *Greek Valerian*.

Phlox

348. *divaricata*, L.; *Phlox*.
349. *pilosa*, L.; *Phlox*.

CONVOLVULACEÆ.

(CONVOLVULUS FAMILY.)

Calystegia

350. *sepium*, R. Br.; *Hedge Bindweed*.
351. *spithamæa*, Pursh.; *Bracted Bindweed*.

Cuscuta

352. *Gronovii*, Willd.; *Dodder*.
353. *glomerata*, Choisy; *Dodder*.

SOLANACEÆ.

(NIGHTSHADE FAMILY.)

Solanum

354. *nigrum*, L.; *Common Nightshade*.

Physalis

355. *Philadelphica*, Lam.; *Ground Cherry*.
356. *viscosa*, L.; *Ground Cherry*.
357. *Pennsylvanica*, L., var. *lanceolata*, Gr.; *Ground Cherry*.

Datura

358. *Tatula*, L.; *Purple Thorn-Apple*.

GENTIANACEÆ.

(GENTIAN FAMILY.)

Gentiana

359. *quinqueflora*, Lam.; *Five-flowered Gentian*.
360. *cinerea*, Froel.; *Fringed Gentian*.
361. *detonsa*, Fries.; *Smaller Fringed Gentian*.

362. alba, Muhl.; *Whitish Gentian*.
363. Andrewsii, Griseb.; *Closed Gentian*.
364. puberula, Michx.; *Blue Gentian*.

APOCYNACEÆ.

(DOGBANE FAMILY.)

Apocynum

365. cannabinum, L.; *Indian Hemp*.
366. androsæmifolium, L.; *Spreading Dogbane*.

ASCLEPIADACEÆ.

(MILKWEED FAMILY.)

Asclepias

367. Cornuti, Decaisne; *Common Milkweed*.
368. ovalifolia, Decaisne; *Milkweed*.
369. phytolaccoides, Prush.; *Poke Milkweed*.
370. purpurascens, L.; *Purple Milkweed*.
371. incarnata, L.; *Swamp Milkweed*.
372. tuberosa, L.; *Butterfly weed*.

Acerates

373. viridiflora, Ell.; *Green Milkweed*.

OLEACEÆ.

(OLIVE FAMILY.)

Fraxinus

374. Americana, L.; *White Ash*.
375. pubescens, Lam.; *Red Ash*.
376. sambucifolia, Lam.; *Black Ash*.

ARISTOLOCHIACEÆ.

(BIRTHWORT FAMILY.)

Asarum

377. Canadense, L.; *Wild Ginger*.

Aristolochia

378. Siphon, L'Her.; *Pipe-Vine*.

NYCTAGINACEÆ.

(FOUR-O'CLOCK FAMILY.)

Oxybaphus

379. *nyctagineus*, Sweet; *Oxybaphus*.

CHENOPODIACEÆ.

(GOOSEFOOT FAMILY.)

Chenopodium

380. *album*, L.; *Pigweed*.
381. *hybridum*, L.; *Maple-leaved Goosefoot*.

AMARANTACEÆ.

(AMARANTH FAMILY.)

Amarantus

382. *retroflexus*, L.; *Amaranth*.
383. *albus*, L.; *White Amaranth*.

POLYGONACEÆ.

(BUCKWHEAT FAMILY.)

Polygonum

384. *acre* H. B. K.; *Water Smartweed*.
385. *amphibium*, L., var. *aquaticum*, Willd.; *Water Persicaria*.
386. *aviculare*, L.; *Knotgrass*.
387. *aviculare*, L., var. *erectum*, Roth.; *Knotgrass*.
388. *dumetorum*, L.; *Climbing False Buckwheat*.
389. *Hydropiper*, L.; *Common Smartweed*.
390. *orientale*, L.; *Prince's Feather*.
391. *lapathifolium*, Ait.; *Smartweed*.
392. *incarnatum*, Ell.; *Knotweed*.
393. *Persicaria*, L.; *Lady's Thumb*.
394. *tenne*, Michx.; *Knotweed*.

Rumex

395. *orbiculatus*, Gray.; *Great Water Dock*.
396. *Britannica*, L.; *Pale Dock*.
397. *crispus*, L.; *Curled Dock*.
398. *Acetosella*, L.; *Sheep Sorrel*.

ELAEAGNACEÆ.

(OLEASTER FAMILY)

Shepherdia

399. *Canadensis*, Nutt.; *Canadian Sheperdia*.

SANTALACEÆ.

(SANDALWOOD FAMILY.)

Comandra

400. *umbellata*, Nutt.; *Bastard Toad-Flax*.

EUPHORBIACEÆ.

(SPURGE FAMILY.)

Euphorbia

401. *polygonifolia*, L.; *Shore Spurge*.
402. *corollata*, L.; *Flowering Spurge*.
403. *Cyparissias*, L.; *Garden Spurge*
404. *heterophylla* L.; *Spurge*.
405. *hypericifolia*, L.; *Spurge*.
406. *maculata*, L.; *Spurge*.

Acalypha

407. *Virginian*, L.; *Three-seeded Mercury*.

URTICACEÆ.

(NETTLE FAMILY.)

Ulmus

408. *fulva*, Mich.; *Slippery Elm*.
409. *Americana*, L.; *White Elm*.
410. *racemosa*, Thomas; *Rock Elm*.

Celtis

411. *occidentalis*, L.; *Sugarberry*.

Urtica

412. *gracilis*, Aiton.; *Nettle*.
413. *dioica*, L.; *Stinging Nettle*.

Laportea

414. *Canadensis*, Gaudich; *Wood-Nettle*.

Cannabis

415. *sativa*, L.; *Hemp*.

Humulus

416. *Lupulus*, L.; *Hop*.

JUGLANDACEÆ.

(WALNUT FAMILY.)

Juglaus

417. *nigra*, L.; *Black Walnut*.
418. *cinerea*, L.; *Butternut*.

CUPULIFERÆ.

(OAK FAMILY.)

Quercus

419. *alba*, L.; *White Oak*.
420. *coccinea*, Wang, var. *tinctoria*, Gray; *Black Oak*.
421. *macrocarpa*, Michx.; *Bur Oak*.
422. *rubra*, L.; *Red Oak*.

Corylus

423. *Americana*, Walt.; *Hazle-nut*

Ostrya

424. *Virginica*, Willd; *Iron Wood*.

Carpinus

425. *Americana*, Michx.; *Water Beech*.

BETULACEÆ.

(BIRCH FAMILY.)

Betula

426. *papyracea*, Ait.; *Canoe Birch*
427. *pumila*, L.; *Low Birch*.

Alnus

428. *incana*, Willd.; *Speckled or Hoary Alder*.

SALICACEÆ.

(WILLOW FAMILY.)

Salix

429. *cordata*, Muhl.; *Heart-leaved Willow*.

430. *humilis*, Marshall.; *Prairie Willow*.
431. *lucida*, Muhl.; *Shining Willow*.

Populus

432. *tremuloides*, Michx.; *American Aspen*.
433. *monilifera*, Ait.; *Cotton-wood*.

CONIFERÆ.

(PINE FAMILY.)

Pinus

434. *Strobus*, L.; *White Pine*.

Juniperus

435. *Virginiana* L.; *Red Cedar*.

ARACÆ.

(ARUM FAMILY.)

Arisæma

436. *triphyllum*, Torr.; *Indian Turnip*.
437. *Dracontium*, Schott.; *Green Dragon*.

Calla

438. *palustris*, L.; *Water Arum*.

Symplocarpus

439. *foetidus*, Salisb.; *Skunk Cabbage*.

Acorus

440. *Calamus*, L.; *Sweet-Flag*.

TYPHACEÆ.

(CAT-TAIL FAMILY.)

441. *latifolia*, L.; *Common Cat-tail*.

Sparganium

442. *Simplex*, Huds.; *Bur-reed*.

NAIADACEÆ.

(PONDWEED FAMILY.)

Potamogeton

443. *amplifolius*, Tuck.; *Pondweed*.

444. *natans*, L.; *Pondweed*.
 445. *puuciflorus*, Pursh.; *Pondweed*.

ALISMACEÆ.

(WATER-PLANTAIN FAMILY.)

Alisma

446. *Plantago*, L., var. *Americanum*, Gr.; *Water Plantain*.

Sagittaria

447. *variabilis*, Engelm.; *Arrow-head*.

ORCHIDACEÆ.

(ORCHIS FAMILY.)

Spiranthes

448. *gracilis*, Big.; *Ladies' Tresses*.

Calopogon

449. *pulchellus*, R. Br.; *Grass Pink*.

Cypripedium

450. *candidum*, Muhl., *Small White Lady's Slipper*.
 451. *parviflorum*, Salisb.; *Smaller Yellow Lady's Slipper*.
 452. *pubescens*, Wild.; *Larger Yellow Lady's Slipper*.
 453. *spectabile*, Swartz.; *Showy Lady's Slipper*.

AMARYLLIDACEÆ.

(AMARYLLIS FAMILY.)

Hypoxis

454. *erecta*, L.; *Star-Grass*.

IRIDACEÆ.

(IRIS FAMILY.)

Iris

455. *versicolor*, L.; *Larger Blue Flag*.

Sisyrinchium

456. *Bermudiana*, L.; *Blue-eyed Grass*.

DIOSCOREACEÆ.

(YAM FAMILY.)

Dioscorea

457. *villosa*, L.; *Wild Yam-root*.

SMILACEÆ.

(SMILAX FAMILY.)

Smilax

458. *rotundifolia*, L.; *Common Greenbriar*.

LILICEÆ.

(LILY FAMILY.)

Trillium

459. *grandiflorum*, Salisb.; *Wake-Robin*.
460. *erectum*, var. *declinatum*, Gr.; *Birthroot*.
461. *cernuum*, L.; *Nodding Trillium*.
462. *nivale*, Riddell; *Dwarf White Trillium*.

Zygadenus

463. *glaucus*, Nutt.; *Zygadene*.

Uvularia

464. *grandiflora*, Smith; *Bellwort*.

Smilacina

465. *racemosa*, Desf.; *False Spikenard*.
466. *stellata*, Desf.; *False Solomon's Seal*.
467. *bifolia*, Ker.; *Two-leaved Solomon's Seal*.

Polygonatum

468. *biflorum*, Ell.; *Smaller Solomon's Seal*.
469. *giganteum*, Dietrich; *Great Solomon's Seal*.

Asparagus

470. *officinalis*, L.; *Garden Asparagus*.

Lilium

471. *Philadelphicum*, L.; *Wild Red Lily*.
472. *superbum*, L.; *Turk's-Cap Lily*.

Allium

473. *stellatum*, Nutt.; *Wild Garlic*.
474. *Canadense*, Kalm.; *Wild Garlic*.

JUNCACEÆ.

(RUSH FAMILY)

Luzula

475. pilosa, Willd.; *Wood Rush*.
476. campestris, DC.; *Wood Rush*.

Juncus

477. filiformis, L.; *Bog Rush*.
478. effusus, L.; *Soft Rush*.
479. nodosus, L.; *Bog Rush*.
480. pelocarpus, E. Meyer; *Bog Rush*.
481. tenuis, Willd.; *Bog Rush*.

PONTEDERIACEÆ.

(PICKEREL-WEED FAMILY.)

Pontederia

482. cordata, L.; *Pickereel-weed*.

COMMELYNACEÆ.

(SPIDERWORT FAMILY.)

Tradescantia

483. Virginica, L.; *Common Spiderwort*.

EQUISETACEÆ.

(HORSETAIL FAMILY.)

484. arvense, L.; *Common Horsetail*.
485. sylvaticum, L.; *Wood Horsetail*.
486. hyemale, L.; *Scouring Rush*.

FILICES

(FERNS.)

Polypodium

487. vulgare, L.; *Polypody*.

Pellæa

488. gracilis, Hook; *Cliff Brake*.
489. atropurpurea, Link.; *Cliff Brake*.

Pteris

490. *aquilina*, L.; *Common Brake*

Adiantum

491. *pedatum*, L.; *Maiden hair*.

Camptosorus

492. *rhizophyllus*, Link.; *Walking Leaf*.

Asplenium

493. *thelypteroides*, Michx.; *Spleenwort*.
494. *Filix-fœmina*, Bernh.; *Lady-Fern*.

Aspidium

495. *Thelypteris*, Swz.; *Wood Fern*.
496. *Noveboracense*, Swz.; *Shield Fern*.

Struthiopteris

497. *Germanica*, Willd.; *Ostrich Fern*.

Cystopteris

498. *fragilis*, Bernh.; *Bladder Fern*.
499. *bulbifera*, Bernh.; *Bladder Fern*.

Woodsia

500. *obtusa* Torr.; *Woodsia*.

Dicksonia

501. *punctilobula*, Kunze.; *Dicksonia*.

Osmunda

502. *Claytoniana*, L.; *Flowering Fern*.
503. *cinnamomea*, L.; *Cinnamon Fern*.

Botrychium

504. *ternatum*, Swz.; *Moonwort*.

This catalogue contains the herbs, shrubs and trees of Lake Pepin Valley as far as I know them. The two large families of Grasses and Sedges are omitted, simply because I am not sufficiently familiar with them to make a list. There are doubtless many mistakes and omissions, but I have done the best I can, with my present knowledge, and therefore make no apology.

SARA MANNING,
Lake City, Minnesota.

DISCUSSION ON MISS MANNING'S PAPER.

At the conclusion of the reading of this paper, Mr. J. C. Plumb, of Wisconsin, arose and said: Mr. President: I have listened with so much interest and admiration to the reading of the paper we have just heard, that I wish to congratulate your society upon having taken up such a subject and made so good a beginning in the treatment of it. The paper is commendable from several points of view. First, it shows a practical acquaintance with the abundant flora of the region, as well as an intelligent and a novel arrangement in the order of presentation, based upon the habitat of the native plants. Commencing with the lowest valley and ascending to the summit of the bluffs, or passing from prairie to woodland, and from bench to swale, the writer finds and describes to us at each step a new variety or species. Second, it is an illustration of the prevalence of natural selection or adaptation in plant life to certain soils and aspects; and a valuable lesson in horticulture was that where she found the most delicate plants upon the northern slope of the bluffs. I hope your society will encourage such valuable efforts in this work of exploring the natural treasures of horticulture which abound in the northwest. It is a neglected field, and yet one in which there should be many such workers, as the writer of this paper; and not only is the field of botany open, but in entomology and ornithology, in both scientific and economic relations, is there a similar need of careful study in the west, and they, with botany, are especially adapted to the capacity and nature of our young women.

Mr. McHenry. I wish to inquire of Miss Manning whether she has ever found the trailing arbutus in the Lake Pepin Valley.

Miss Manning. I have never met it near Lake City. If found in our part of the state it must be very rare.

Mr. Golden. I have seen it near Plainview, in Wabasha county, where I live.

Mr. Porter and other members spoke in terms of high appreciation of the paper.

Mr. Emery. Mr. President : In order to express what this discussion shows to be the general sentiment of the society, I move that a vote of thanks be tendered to Miss Manning for her valuable paper ; that she be declared an honorary life member, and that we request her to continue her contributions in botany for the benefit of our future meetings and for publication in the annual reports.

The motion being seconded, was adopted by a unanimous vote.

MORNING SESSION.

Second day, Wednesday, January 16th.

The discussion of the paper of Mr. Sias, read last evening, being first in order, Col. Robertson, said :

Mr. President:

I endorse the remarks of Mr. Sias about the value of the Cottonwood. It is one of the poplars, which derive their general name from the fact that they are the people's trees; easily grown, thrifty, adapted to many climates, soils, situations and aspects; hence *popular*. The only objection to it as a street tree is its cotton, which is often complained of as a nuisance in houses and about the walks. To avoid this cotton where it is objectionable, we have only to select cuttings from the male trees, as it is the female trees which bear the cotton. When the trees are in bloom the males can be distinguished by the absence of the cotton and marked.

Mr. Sias. I am glad to be reinforced by Col. Robertson in my estimate of the value of the Cottonwood. I agree to what he says about avoiding the cotton for street trees, by selecting cuttings from the males; but for general purposes of forests and wind-breaks, the cotton is nature's provision for distribution of the seeds. They rise upon the winds and are floated and born about for long distances and over vast tracts of country, falling and germinating oftentimes where most needed and where otherwise they would not be found. For this reason I say let the cotton fly till the tornadoes quit.

Secretary Gibbs. While the cottonwood is undoubtedly adapted to any part of Minnesota, our reports are looked to as authority in tree culture for vast districts to the Northwest of us, and we

must be careful and not mislead our friends anywhere. It was my good fortune to be one of a number of members of the American Forestry Congress who went out on the Northern Pacific Railroad last August as far west as Mandan, on the Missouri river, opposite Bismarck, and I found that it was the opinion of the scientific foresters in that company, frequently expressed from day to day as we journeyed along, that the cottonwood would not endure the dry climate of Western Dakota; that after you pass out of the alluvial soils of the Red River district, closing westerly with the Cheyenne Valley, this tree must necessarily be short-lived except along the low margins of streams. Its natural limit of life being from ten to fifteen years in the dry regions, and apt to be shorter unless sustained by excessive irrigation.

On our arrival at Bismarck we found a striking proof of this conclusion of science. On the farm of Mr. Jackman, at Bismarck, in a basin of one of the Missouri benches (the situation being the most favorable of any outside of the Missouri levels themselves, where water is deposited by the floods,) we found a plant of cottonwoods some twelve years of age, surrounding a three-acre garden, and were informed by the proprietor that they had been kept alive at an expense of eleven hundred dollars for hauling water to them from the Missouri. In the line of these trees as they passed around the garden were some elevations and depressions, and most of the trees on the elevations had begun to die from the tops down, evidently for the want of sufficient moisture in the ground and in the air to sustain them at their present age. The total precipitation, rain and snow, in that region is only about twelve inches annually, as against 30 to 40 in Minnesota, and it is perhaps safe to suspect, at least, that, in such aridity, the cottonwood is not the tree that will be profitable. I would prefer not to give any names, but leave the scientists of that party to speak for themselves; but as the railroads have been spending large sums of money in cottonwood planting on these dry western plains, and the people are following their example, attention should be directed to this question of adaptation in forestry with the view of ascertaining if we have any really valuable tree that will grow to maturity there, away from the river bottoms. Prof. Budd claims that the Russian form of the white poplar (*Populus Alba*) or silver-leaved poplar, has this adaptation, and, besides, that the tree is upright in growth like our American white pine, does not sucker like our American white poplar, and that its wood is of such a nature as to make it almost as valuable as the white pine for

manufacturing and all the purposes of timber. It is said by Prof. Bessey, as I have been informed, that its adaptation to arid regions comes, like that of a large class of other plants and trees of like adaptation, from its peculiar cell structure, which has a cap on its upper surface, closing in dry periods when necessary and resisting loss of moisture by evaporation. The box elder, or ash-leaved maple, is also thought by many to be adapted to regions too dry for the cottonwood. What has misled our people about the adaptation of the cottonwood is that it grows almost anywhere while it is young.

NATIVE PLUMS.

BY O. M. LORD, OF MINNESOTA CITY.

No wild fruit is more widely or abundantly distributed in this country than the plum. Along the margins of all the streams, and in almost every locality of moist land not subject to annual fires, groves of them abound, which produce in some years large quantities of excellent fruit. No wild fruit more readily responds to cultivation, in producing quantity and improvement in quality, and I would invite increased attention to its merits on the part of the State Horticultural Society, and also on the part of those who cannot give the subject of fruit culture much attention. There are hundreds of homes all over the country entirely without fruit, that might be provided with it by a small outlay of time and labor, without money, in the cultivation of native plums. President Harris says, in the last report :

“ We have some choice native varieties well worthy of propagation.” I believe this statement so true, is not appreciated in full, as with one or two exceptions, these choice varieties are comparatively unknown, or at the most have only a local celebrity, and the object of this paper is to call the attention of the society to them, that their merits may be discussed and compared, and the results disseminated, which is a shorter and better method for the masses to obtain good fruit than individual experimenting.

This fruit has received from the Illinois and Iowa Societies, marked notice.

Prof. Budd, at the Iowa Agricultural College, has a large collection of natives for testing, with the kinds commonly cultivated, and the opinion is prevalent among fruit men, that we must look to the natives for any great improvement upon our cultivated varieties which are not hardy in this latitude. Some of the blue plums have occasionally succeeded in this vicinity. Mr. Wilcox, of La Crosse, has fruited Moore's Arctic with some success, and Mr. B. Taylor, of Fillmore county, has had moderate success with a blue plum, from Iowa. Mr. Bollman, of Winona county, has top-worked some natives with a large blue plum, and produced several good crops. With these exceptions, I have not been able to learn that any one has been successful with the varieties usually found in the eastern and southern nurseries.

So far as I am informed, the only efforts to improve the natives in this vicinity have been in selecting from the groves, and simply transplanting, without any particular system of after culture. In this county a good many trees have been transplanted without any proper selection, taking the first at hand. In almost every case this method has proved unsatisfactory from the poor quality of the fruit. A better plan is to carefully observe the quality of the fruit as it grows naturally, and mark the trees, and afterwards at the proper season, transplant. If the trees are too large or too old, cut the roots, leaving them in the ground to sprout, and transfer the small trees. By this means you are sure to get fruit of the same kind, while planting the seeds might produce many varieties not equal to the original. Only a few of the natives have as yet been brought into prominent notice, but there are scattered here and there a good many valuable kinds that should be more widely known. Prof. Budd, in the Iowa report, mentions some natives, as worthy of cultivation.

Mr. B. Taylor, of Fillmore county, has been experimenting for twenty years or more, and has produced some which he considers superior to any wild ones in market. Mr. Cottrell, of Olmstead, has one which has taken the premiums at the fairs, and is pronounced excellent by all who have tested it. The late P. A. Jewell, several years ago, found on the grounds of Mr. Brainerd, of this county, what he considered a very superior variety which he propagated and named Brainerd's Best.

Of those which are known to be adapted to general cultivation, the Desoto heads the list. The Forest Garden is quite prominent. The Weaver is successful, and some of the Chickasaw varieties in some locations do very well, but there are many others compara-

tively unknown, that in quality and desirability compare favorably with any of those mentioned, and if they could be brought into notice by propagation, would be considered valuable additions to our list of fruits.

A prominent fruit dealer of Winona informs me that he has frequently received some of our natives, that in quality were superior in every respect to many of the old kinds that were offered in the market, not excepting the little damson, nor the far-famed Californias.

By far the larger part of our natives do not differ materially in character; I believe the species in America is limited to three: the sand or beach plum of the Atlantic coast, the chickasaws of the Gulf States and our common wild plum. This latter is too well known to need description here; but there are a few points that need to be borne in mind in making selections for improvement. As a rule, this species has a thick acrid skin, which in cooking has a tendency to dry up and toughen; a soft, juicy pulp, which spoils in carrying, and an acrid taste about the seed, that imparts often a disagreeable flavor.

Whenever a native can be found with a skin that is thin and tasteless, which disappears in cooking, with a pulp fleshy instead of juicy, and with the seed small and free, we may be sure of something worth propagating. Prof. Budd says the Speer plum possesses the first of these qualities, and is excellent for cooking. Mr Taylor has secured among his, one with the second, a fleshy pulp with a rich peachy flavor, of large size, bears carrying well, and valuable for table use. Mr. Cottrell's plum, and some others growing in this and adjoining counties, possess very nearly all these desirable qualities. They are also from one to three weeks earlier than the Desoto, but do not appear so fine in the market. They have, however, one quality which makes them for canning superior; when mature the skin slips off easily, leaving the pulp firm and shapely.

As in the cultivation of all fruit there are some difficulties to encounter, it may be well to mention some of the most common to the plum. The curculio is probably the greatest; the black knot is next, and there is a tendency of all wild ones to rot on the tree when brought into cultivation.

Probably no good plum will be found to be curculio proof. Nature beats them with numbers of trees and quantity of fruit. This may be a hint to us; but the journals have thoroughly discussed this part of the subject, and have attempted to point out

remedies. The black knot when it attacks is very destructive. A writer in one of the prominent New England journals claims that it is occasioned by poverty of soil, and poor cultivation. This is a mistake, as natural groves of thrifty wild ones are frequently entirely killed by it. The only safety lies in carefully cutting out and burning every appearance of it, by which means it can be prevented from doing any harm.

In regard to rotting on the tree, it is found that some varieties are much more liable than others, but close pruning of the tree and thinning of the fruit are the most effectual remedies. As an offset to these difficulties in growing the trees, its advantages are that it is tenacious of life, and adapted to all our soils, whether on the stiff clays of the high lands or on the light sands of the river bottoms; it withstands our hardest winters, being perfectly hardy, and is as prolific as any tree that bears fruit. It is also easily propagated, either by budding, any manner of grafting, growing from pieces of the root, or planting the seed.

DISCUSSION OF MR. LORD'S PAPER.

Mr. Emery. Does the curculio spoil the plum when it fails to puncture the pit?

Mr. Golden. Yes. I find a small black spot where the insect simply pierces the skin. It there deposits the egg, and if the larvæ is strong enough, it makes its way in and destroys the plum.

Mr. Emery. I think the egg is deposited usually within two weeks after the appearance of the bloom, but if the pit is not punctured, the egg dies, the wound heals up, the plum, though somewhat injured, grows on to maturity. This is my conclusion after considerable observation of the plums we have growing in this state.

Mr. R. Porter recommended scraping the rough bark from the trees, thus removing the hiding place of the curculio.

Mr. Gideon had tried sprinkling his trees with a weak solution of coal tar and chloride of lime. Went over them three times, always repeating the operation after a rain. He found the remedy successful. Few plums and not a single peach were injured.

Secretary Gibbs. The best remedy I have seen for the curculio, was pointed out to me last September by Dr. E. Lewis Sturtevant, director of the New York Agricultural Experiment Station, at

Geneva. He took me into a little plum orchard of about thirty trees, surrounded by a high picket fence. The trees were then loaded with fruit, only about three per cent. of which showed any injury from the "Little Turk" or any other insects. A dozen hens were kept confined there, and their natural desire and necessity for animal food, held them close enough to the insect bill of fare to reduce the loss of fruit to a very moderate limit. Outside this enclosure were a few plum trees belonging to the same orchard, whose fruit was entirely ruined by the curculio.

Mr. Gideon. The hens have the range of our plum orchard, and the trees are full of curculios.

The Secretary. Are the hens confined there?

Mr. Gideon. No.

The Secretary. That tells the story. They are not obliged to eat curculio, for they can find animal food that they like better. You can compel hens to eat potato bugs by confinement, and when the appetite is created, they will eat them voluntarily, as some of our human folks will tobacco.

Mr. Emery. Does the benefit from hens go over to next year?

Secretary Gibbs. In a measure doubtless, as the hens take them mostly in the chrysalis state.

Mr. Gideon. There is a native blue plum in the Lake Minnetonka district, similar to the damson, and I have heard of another native at Lake Osakis that is said to be as large as a hen's egg.

Mr. Whipple. I am well acquainted with the wild fruit of Lake Osakis. It is no larger than we have at Lake Minnetonka. I have been experimenting with the hen and insect question for ten years. Confining the hens compels them to destroy the insects. From a clump of plum trees near my house, where the hens have their promenade, we get plenty of fruit, when other trees not so protected, yield none.

Secretary Gibbs. We are continually receiving accounts of new and desirable fruit in various parts of the state, but as yet the society has failed to utilize this information. I am convinced that the only way to do it, is to have some one authorized to search these things out, and if promising, to pack and distribute cions.

Mr. Gideon. I think an agent should be sent out for this purpose.

Truman M. Smith. Mr. Lord sent me a box of his plums, and I think they were the best native plums I ever saw.*

*NOTE BY THE SECRETARY.—Since this meeting I have visited Mr. Lord and examined his trees, and would recommend applications to him for cions for grafting on common wild plum trees. This may get me into trouble with Mr. Lord, but I trust he will overcome his modesty and sell the cions.

Secretary Gibbs. Elisha Hale, of Lansing, Iowa, gives this account of the DeSoto plum. He has handled more of them and seen more of the fruit than any other man—in fact was the first to give it a wide introduction :

“My experience with it dates back 20 years and over. The tree is perfectly hardy—have never seen a twig killed by frost. The tree is a good grower, a prolific bearer, the fruit large, and of fine quality. Plums $1\frac{1}{2}$ inch in diameter are not uncommon. The only fault I have to find with the tree is an inclination to overbear and break down or else give inferior fruit. The fruit buds and blossoms are hardy. In 1883 I did not get a crop of plums, but some of my neighbors got a fine crop that year. Trees only 5 or 6 feet in height frequently bear the year they are set out—DeSoto trees bear much earlier than the Miner. As to their bearing every year, I can say that the trees frequently bear 3 or 4 years in succession. The trees in my lot in Lansing were planted in the spring of '64, and have borne about 14 good crops. The DeSoto does not make as large a tree as the Miner, but when full grown covers about 20 feet, or 10 feet each way.

A grafted DeSoto bears quicker than one from a sprout or sucker. But from my experience I prefer this tree on its own roots. But it absolutely will not grow from root cuttings like the Miner. The fruit is destroyed more or less by curculio. But it does not rot from the puncture of the insect like some thin-skinned tame plums. Many will mature and make fine plums, even when cut in several places. The fruit ripens about the last week in August, continuing from first to last about 8 days.”

C. Barnard, of Waukon, in the same county, writes to F. K. Phenix: “The DeSoto plum is the best we have tried. We got it in '66 from the original tree near DeSoto, Wisconsin. We named it, and were the first to graft it. It is fully the size of the Miner or larger, more round in shape; color, yellowish red, good for eating or cooking. The tree is hardy and productive.

Mr. Gould's paper on blight being called for was read by the author, and was as follows:

FIRE BLIGHT IN FRUIT TREES.

BY F. G. GOULD, OF EXCELSIOR, MINN.

The disease in fruit trees known as fire blight first developed in this region about twelve years ago. It is a contagious disease; for when it once gets into a orchard it is liable to spread into every tree. Sometimes it drops into a nursery of young trees and destroys every one for rods around.

In the eastern and middle states this disease is known by the name of Pear Blight. Its ravages are found at intervals all the way from Maine to Dakota, and from Minneapolis to Texas. When it first came to this region, its course was from east to west; we heard from it in Wisconsin before it reached here; it then took five or six years for it to travel to Meeker county, fifty miles west of this point. Only for this scourge every family living on a farm in Minnesota could have a supply of apples at least of the rich and fruitful Transcendant crab.

It was believed by many at first to be the effect of some peculiarity in the weather or the electricity in thunderstorms, and by others it was thought to be the work of insects, but now, I think, we may as well settle down to the conclusion that blight perpetuates itself by the transmission of its virus in the atmosphere being blown about by the winds.

Unfavorable conditions of the weather or excessive fertilization puts a tree in condition to take the blight on the same principle that yellow fever, small-pox and cholera are most destructive in communities whose vital forces have been weakened by unfavorable surroundings, habit or diet.

It is a well-known fact that some varieties or families of trees are much more subject to blight than others; in fact, it usually, if not always, begins in the crab trees or their relatives, and then spreads to others standing near, which perhaps are less susceptible, and never would have blighted except for the infection or virus from the blighting crabs which overpowered them.

From the best information at hand, this disease was imported from Russia, being first brought to Russia from China, or, perhaps, was brought direct from China to this country. Many remedies have been recommended. The best, in my opinion, is lime applied

to the trunks and branches of trees in the form of whitewash; and, in my observation, where this has been done they rarely, if ever, blight.

In conclusion. I will say that we may reasonably hope to see the end of this scourge by-and-by, on the general principle that epidemics and various other evils spend their force in time and depart. However, this may be, we have another faith to hang our hopes upon—the belief that the steppes of Russia will furnish us a race of trees, both of the apple and the pear, with constitutions robust enough to resist the ravages of blight and the great extremes of our climate.

BLIGHT.

BY M. PEARCE, OF MINNEAPOLIS, MINN.

In all my experience with rust on wheat and blight on fruit trees, unless the straw, new wood or portions of the leaves were ruptured, no serious harm occurs; or in other words, where there is no rupturing, blight will not exist.

The question then arises, what causes the rupturing of the bark on the new wood and also portions of the leaves?

On philosophic principles, we must come to the conclusion it is the result of a rapid or spasmodic growth, caused by excessive heat and moisture at the roots of the trees, which can be overcome by keeping the soil over the roots of the trees covered with loose mulching four or five inches deep, as far out as the roots extend. I use corn stalks, marsh hay, bean straw, potato vines, or anything of the kind I have on hand. This will give a constant, even and healthy growth, and the trees will never blight if the application is made in the fall or early in the spring; no, not even the Transsidents, which of all trees are the most subject to blight. Mulching is recommended by all scientific writers and close-observing fruit growers. I do not wish it understood that rupturing produces blight, far from that, but it paves the way for something that does, of which we will write. Among the lowest limits of the vegetable kingdom exists a very low order of vegetable life known as Bacteria, so extremely small that it requires a microscope that will give from one to two thousand diameters to bring it to view.

It is supposed to contain as many varieties as the visible kingdom that grows from the soil and possesses as many different qualities. It produces spores or seeds so rapidly that no numbers can express them.

The air and water contain millions of these spores or germs to the square inch; every plant and tree is covered with them. Thousands are taken in at every breath, and as many more are taken into the stomach and intestines every time we swallow. The mouth of every animal is literally full of them. The scientific world are at present, and have been for years, studying the nature of those germs. Several have been minutely described and named, and also what disease they are supposed to produce. One specie known as micrococci is supposed by some to produce diphtheria. An other specie *Bacillus tuberculosis* are very numerous in consumption. Microbe of hydrophobia is supposed to produce that disease. The germ *Bacterium* is supposed to produce the blight on fruit trees, and others the rust on wheat, and so on. Those germs have never been known to attack healthy tissue, but are found in endless numbers on sores, ulcers, putrid flesh in all diseased or dead matter. If it was the nature of those germs to subsist on healthy plants and vegetables and healthy animal life, no living visible thing could exist. It is only on sick or dead matter that they multiply and subsist.

Now when we apply a specie of those germs as the cause of blight, the evidence is very strong that they are the direct cause. The moment the bark bursts and the sap oozes out, it is filled with millions of those spores, and the virus at once poisons the sap, and death ensues as far as the poison sap extends.

Cutting off the blighted portions of the tree is of no benefit unless the wound is at once saturated with carbolic acid, or made air-tight with some kind of wax.

Mr. Gideon. Mr. President, while this subject of blight is before the Society I will add one more paper to these already read.

The President. Very well, we will also hear Mr. Gideon's paper before proceeding with the discussion.

Mr. Gideon then read his paper:

BLIGHT, ITS CAUSE AND CURE.

I wish you a happy and prosperous meeting, and that great good may come of it, by your developing facts, that the light will so shine that the world may see and embrace the truth, until igno-

rance and want are seen and felt no more, and to that end I will add a few thoughts on the subject of blight—the cause and the remedy.

That blight is a malady that floats in the atmosphere is a well-defined fact in its freaks with us, and runs in atmospheric currents, sometimes only a few feet in width, and at other times in a great wave as it were miles in width, but like a tornado, the greatest ruin at its center. For years we have noted its freaks, and perhaps no one fruit grower has had more of it on his grounds than we, more or less, each season for the last 12 years; but the greatest ruin done was in the month of June, 1881, when over a thousand bearing trees were killed dead, and twice as many more badly damaged, their death being only a matter of time, for when the blight strikes on the body of a tree it is death sooner or later. Certain it is a great calamity close akin to the cholera, of which it is a pathfinder now on its third tour around the world, twice followed by the cholera and the cholera again on its track, with a power to expand that no quarantine can long hold in check. Cholera once in motion, like tree blight, is bound to travel wherever it can find congenial food to feed upon, which is debauchery, poverty, and filth; for it was those ingredients that set it in motion, and in quest of that food it travels; but when in motion the more pure and cleanly often fall a prey to it just as they should, as a punishment of the world at large for allowing the oppression that set the calamity in motion. That it was British oppression in India that set cholera in motion, I presume there is no question. Then such a high tariff was put on salt that the poor could not buy it, not even allowed to use sea water, and the result a raging dysentery, which at last took the form of cholera, and swept over the world in the trail of the blight. The barometer shows storms to have an atmospheric path-finder, a current that goes before and opens the way, or in other words lays the track for the storm to travel on. And that cholera floats in the atmosphere no one questions; and is in reality an epidemic storm, though not upturning trees and houses like a tornado of wind, yet its destruction of human life is none the less fearful, and came out of Asia preceded by tree blight and the epizootic—the pathfinders—the warnings of worse to follow, and to guard against the one is to guard against the other—remove the cause that set them in motion. No remedy, nor quarantine yet tried can ward off or stay their onward march nor ever can so long as there is congenial food ahead to tempt onward. To stop the onward march of these maladies, is

to cut short the monopolies—feed the hungry and clothe the naked — make free air and water, give to each enough land to produce the needed comforts of life and no one allowed to hold more. The God of creation gave the earth a free gift to man, and made a curse to follow him who usurped more than his share, as well as to him who suffered himself to be robbed of his natural dues. And in their wake war, pestilence and death are ever sure to follow, in which all classes suffer.

That the mind of man controls the elements, facts are too numerous to admit of a question, for when any great excitement sways any considerable portion of earth's people, the elements take form, as is often noticeable about the time of exciting presidential elections, and when Washington's army lay at Valley Forge was had the coldest winter known in America up to that date, and not repeated until Charlestown was besieged during the rebellion; and when Charles Twelfth invaded Russia they had the hardest winter up to that date and not repeated until the winter Bonaparte burned Moscow; and again during the great French revolution of 1792-3, they had the hardest winter up to that date, and not repeated until Paris was besieged by the Germans, and so run facts in all ages and nations. And accordingly a greedy, grasping, selfish national mind will cut short the farm crop per acre, and in no great space of time turn the most fertile lands to barren wastes. Examples to the point bedot all times, and were facts well understood thousands of years ago, is evident from many ancient writers, who gave as warning to evil doers, if they did not relent, that all goodly things would pass from them, and that on the other hand, that peace and quiet would cause the deserts to become fertile and blossom as the rose. No doubt those ancients founded their conclusions on the data of facts, and since their day, facts to the point loom up in profusion on the four quarters of the globe. Arabia was once renowned for her fertile plains, her balmy breezes, and vast agricultural products, with a population variously estimated at from 40 to 100 millions, but now those plains are vast desert wastes swept by fearful storms, and only roamed over by bands of marauding thieves, the remnant of the well-to-do millions, as barren in mind as the sands over which they roam. But while power yet remained, their greed and self aggrandizement induced them to make conquests of other lands, and first to fall a prey to their greed were Palestine and Asia Minor, the then garden spots of the world, but now barren wastes. Yet not content, over into Egypt they went, then a nation of forty millions, now less than four

millions of half naked brutal Arabs, and the greater part of the once fertile lands are now drifting sands. Thence onward they rode to the ruin of other well-to-do nations that lived on the south coast of the Mediterranean, now nearly the entire stretch a part of the great Sahara desert, dotted here and there by the most poverty stricken of mortal beings; rode down there after self aggrandizement, and following little else than war, piracy, theft and murder. The Arab's greed made ruin at home, and ruin wherever he strode. At his tread fertile fields turned to sands, and to match his breath, balmy breezes mounted up to great desert storms, often burying or suffocating whole caravans of thousands in one drift. And of the plagues of Egypt all are familiar, and so of all other oppressed nations, all beset with plagues, and they on the increase in number and kinds, so that insects, blight, mildew or rot, is on every goodly thing we grow; and from year to year there is a falling off of crops per acre, new lands not yielding what new lands did twenty-five years ago. In the south, the negro was made a beast of burden—sold, whipped, and driven to unpaid labor—and the result, millions of acres of once fertile lands are now worthless. And in the north the Indian is driven from lands to those of less worth, and year by year on those lands our crops grow less, with insect enemies, blight, mildew and rot on the increase—a warning that worse is ahead, that utter ruin is the reward of persistent evil doing. The history of all ages, of men and nations, proclaims trumpet-tongued, that to be prosperous, is to be at peace; that evil, like good, brings its own reward. Though justice often appears to lag, the history of the past shows it is sure, that like great storms, the slower it comes the greater the shaking up when it does come.

Therefore, it behooves every thinking person to ponder well the signs of the times, bearing in mind the fact that Nature and Nature's God are one, and proclaim, though hand joined in hand, oppressors shall have a fall, and woe be to those who look calmly on oppression when that fall shall come.

The nation's foot has made one slip, and with the accumulated sins, frauds, oppressions and murders, another slip will be a crash as never seen before, and naught but a speedy change to the right can stay the nation and banish the evils that now beset us—monopolies, saloons (hell dens), wherein whisky, beer and tobacco are dealt out—a thousand fold more ruinous than insects, blight, mildew and rot combined.

PETER M. GIDEON.

Excelsior, Minn., Dec. 10, 1883.

DISCUSSION ON BLIGHT.

Col. Robinson spoke on the subject, but so rapidly that the notes are unreliable. Notes from his own pen have been applied for, and may appear in the Secretary's portfolio. He was understood to say that Mr. Gould's paper was correctly descriptive, and that Mr. Pearce was in the line of science as to the cause of blight.

Mr. Emery did not agree with the theory that only diseased matter is attacked. He thought all rank, soft growth should be avoided. A steady, even growth he considered the most favorable. We must keep our trees from growing too fast.

C. L. Smith mentioned a case where he saw severe blight on one end of a row of Transcendents that stood in good soil and showed a healthy even growth; at the other end, with poor soil, but with heavy mulching, there was no blight.

Mr. Plumb. Blight is a secondary disease, and follows a disorganized condition of tissue. Crab trees blight more readily than apple, on account of their more compact structure, not so readily yielding to excessive sap pressure. They winter kill less for the same reason. Our best remedy against blight is to grow our trees moderately, neither allowing them to be forced or the soil to become impoverished. Thin soil, plenty of air, equal temperature near large bodies of water, are favorable conditions. Grow trees in the right way, and there will not be much danger. Grow slow, with moderate culture; don't overfeed.

Mr. Emery. What tree is least subject to blight?

Mr. Plumb. The Duchess of Oldenberg.

Mr. Gideon. Everything takes the blight on my grounds. I think there is no variety of the apple that the blight will not touch. Sometimes my Transcendents are the most exempt.

Mr. Plumb recommended the keeping of careful records of all facts appertaining to blight, temperature, storms, condition of trees of various kinds in periods of blight. He thought a knowledge of its causes would be thus eventually arrived at.

Mr. Pearce. I am not afraid of blight. I can stop it as easily as the itch.

Mr. Gould. You will get it yet.

R. Porter. I thought so once. So did Sias. But I have had it and so has Sias. Had it bad. It will come to Pearce yet.

Mr. Sias. Would it not be profitable to make application of chemicals? He had heard of cases where kerosene cans have been

hung on the trees, and the blight stopped, and had himself stopped it on a Flemish Beauty pear tree by cutting off the blighted limb and binding upon the wound a cloth saturated with kerosene.

C. L. Smith had known of similar results with the kerosene remedy.

The remainder of the morning session was occupied by the reading of the following communications.

DOES IT PAY A FARMER TO FOOL WITH APPLE TREES IN MINNESOTA.

The above question was asked me, to which I emphatically answered, no; yet I think that with due care and intelligence a farmer can make it both pleasant and profitable to raise apples in Minnesota. My opinion is based on my own experience, a part of which I will here give.

I have in my orchard a plat of land containing twenty-seven square rods on which stand twenty-seven apple trees. Some of them bore the first time this year, and some of them from overbearing last season had but few scattering apples on them, yet after supplying the wants of two families on the farm, I gathered and sold one hundred and nine and three-quarter bushels of apples, which, after paying freight, commission, etc., brought me \$104.86 this being about six hundred dollars per acre for the use of the land, and one hundred times as much as my grain land netted. I shipped my crab-apples to St. Paul in sugar barrels, and received \$4.09 net for them per barrel.

SIDNEY CORP,
Hammond, Wabasha County, Minn.

A NEW AND VALUABLE GRAPE.

ROSEMOUNT, MINN., Dec. 14, 1883.

Mr. Oliver Gibbs, Jr.

DEAR SIR: A Wild Grape has recently come under my observation which is surely worthy of your notice and general cultivation. It is in the door-yard of Mr. D. F. Akin, near Farmington, Minnesota.

Mrs. Akin told me last week, they brought it from Dutchess county, N. Y., years ago. They call it a *Fox Grape*; but it is not the color of the fox grapes we knew east of the Mississippi; those were like the Catawba, and large as the Muscadine of the South.

This Akin grape is black, each grape large as the Concord; the clusters larger and compact. Of course it is not a table-grape, is sour, and best after frost. For cooking purposes is excellent; makes *delicious sauce, jelly, jam, pies and ketchup*. Then too, it is an iron-clad; (may be a Russian.) Bore bushels the past summer, even after last winter's abominable *40 and 45 degrees!* They never give it any protection; has long since outgrown its trellis and runs in luxuriant abandon over two or three adjacent trees.

Yours, truly,

HORTENSE SHARE.

On motion of Truman M. Smith, the reading of the report of the delegate to the American Pomological Society was made a special order for this afternoon.

AFTERNOON SESSION.

Second Day, Wednesday, Jan. 16th.

The exercises were opened by music by the University Glee Club.

Mr. Mendenhall, Entomologist of the Society, read the following report:

ENTOMOLOGICAL NOTES FOR THE SEASON OF 1883.

By R. J. MENDENHALL, OF MINNEAPOLIS.

Mr. President, Ladies and Gentlemen :

As the years roll on our State is becoming more and more densely populated by a very undesirable class of immigrants; a class which appropriates to its use literally the fruits of others' labor, without even a civil "by your leave," and whose operations are conducted in such a stealthy and irregular manner that the farmer and horticulturist have no redress for the disappointments and losses occasioned by it. The only law against these marauders is "lynch law," but the rascals are more difficult to catch and more certain to reappear than were even the Younger and James boys in Missouri. It is needless to say that I refer to the annually increasing numbers of destructive insects that appear in our fields and gardens.

Minnesota has her share of beetles, bugs and worms that are "to the manor born," not to mention the afflicting mosquito, and all its blood-thirsty kindred, but among these were very few that

showed a taste for cultivated vegetation, and for many years Minnesota enjoyed a happy immunity from the worst species of injurious insects. We even conceived and congratulated ourselves on the idea that our cold winter and late springs would forever exclude some of these from our borders. The fallacy of this opinion is forced upon us every year as one after another we recognize the grain and garden pests with which our sister states have long been afflicted. The ways of insects are, in this respect almost past finding out. Entomologists are learning that it is not safe to risk their reputations on the prediction that certain latitudes are too high or too low, or certain situations too wet or too dry, to be in danger from the ravages of this or that particular species. The only reliable conclusion is, that wherever wheat is grown, will be found sooner or later, the various insects that prey upon it; and so with corn, potatoes, cabbages, apples and other fruits. To this rule there are possible exceptions, but none of importance occur to my mind at this moment.

Since it cannot then be denied that we are subject to this annually increasing loss of farm and garden products through the depredations of these insignificant but potent foes, it is but proper to give them some attention, and that we devise and discuss plans for their extermination. And here I must repeat what I have said before, that to fight insects intelligently and to advantage, we *must* be able to recognize them in their different stages of development and be familiar with their habits. If we know the latter, we can often find them "off guard," and can destroy them by a very small outlay of labor and money, otherwise, while a destructive species *may* be headed off, to some extent, "by main strength and awkwardness," it is usually at a great expense of labor and of druggist's supplies.

I do not claim that the scientific entomologist is alone able to suggest the best measures to be taken against destructive insects, for the practical farmer or gardener, who has an observing eye and a mind capable of logical deductions, will often hit upon a better remedy than the man of cabinets and catalogues; but the methods of prevention are usually devised by the latter, and his aid is invaluable in enabling the unscientific observer to distinguish between insects whose work on grain or fruit or foliage has the same effect, but whose habits are so entirely different, that a remedy that would be effective against one, would be absolutely worthless against another.

As an illustration of this point, it was discovered some years ago that the ravages of the canker worm on the elm trees in one of our eastern cities, might be easily prevented by encircling the trunks with shallow tin troughs filled with oil, or by the application of bandages smeared with tar or refuse molasses or any other sticky substance. The philosophy of this remedy was, that the female canker worm moth, having no wings, and coming out of the ground was obliged to *crawl* up the trunk of the tree to reach the twigs on which she naturally laid her eggs from which the worms were hatched. As she ascended the tree therefore, she would be obliged to cross the obstructions in her path, and would either be drowned in the oil or stuck fast on the viscid bandages; in either case she would perish without accomplishing the object of her life. This remedy had worked to satisfaction in the city referred to for some years, when the elms in another eastern city began to suffer serious defoliation. The "city fathers" of the latter, having no knowledge of any insect on the elm but the canker worm, put their city to considerable expense for oil troughs for the trees, and when, season after season, the ravages of the pest showed no diminution, could not conceive why a remedy that worked so well in one city should be absolutely useless in another. The riddle was finally solved by an entomologist who explained that the damage done in the last mentioned case, was not the work of canker worms, but that of a leaf-feeding beetle *Galeruca californiensis*, Fabr., the female of which has ample wings with which she could readily fly from the ground into the branches of the tree and that she was not in the least inconvenienced by the oil troughs that had been placed for her destruction. So again the codling moth, the apple curculio and the apple maggot, are all destructive to the fruit of the apple, but the best methods for preventing the attacks of the first mentioned of these insects would be of no avail against the other two. These instances show conclusively the value of a knowledge of the differing forms and habits of differing species whose disastrous work on fruit or foliage may be very similar.

I am sorry to say that the study of entomology is still in its earliest infancy among us. It is indeed surprising that this branch of natural history should have so few votaries in a region so abounding with striking and beautiful insect forms. It has not by any means kept pace with its sister sciences of botany and ornithology, each of which have in our city alone, quite a number of excellent workers.

I am afraid the "bug hunter" is yet looked upon by most of our people as a sort of human curiosity, "not quite right in the upper story," who wastes his time hunting for worms and sticking butterflies in boxes, and is a fit subject for ridicule.

In this respect I am happy to state that our horticultural society is far in advance of local, popular opinion, and has always recognized the importance of and encouraged the systematic study of the insects affecting the food products of the State. But though *we* may be able to do but little to advance this study, it has made wonderful progress in other parts of the country during the last twenty years. Such a thing as economic entomology had then scarcely been heard of, and there were probably not fifty known students of the science in the country a quarter of a century back. Now we have hundreds of enthusiastic amateur and professional entomologists and a vast array of creditable publications. And here I beg leave to mention two works that have appeared within the year that are more than ordinarily instructive. One of these is a little volume on the "Insects Injurious to the Farm and Garden," compiled mainly from Prof. Riley's Missouri Reports, by Mrs. Mary Treat, and published by the Orange Judd Co., of New York. It is much condensed, but is a most convenient reference book on the subject of which it treats. The second work to which I allude is Mr. William Saunders' "Insects Injurious to Fruits," published by J. B. Lippencott, Philadelphia. Mr. Saunders is the editor of the Canadian Entomologist and also well known as a horticulturist of London, Ontario. His work should be in the hands of every fruit-grower and nurseryman. It is, as our appreciative secretary phrases it, one of rare excellence, with numerous clear and beautiful illustrations and plain and careful descriptions, by whose aid the mere novice can readily recognize the species of insects that are most destructive to his crops. The insects affecting each kind of fruit are conveniently grouped together and with each are given such remedies and preventive measures as have been thoroughly tested and found valuable.

With this rather long and rambling introduction I proceed to the consideration of the species of insects that were brought to my notice during the past season, either by observation or correspondence. The most important of these were the chinch bug, the boll or corn worm, the cabbage butterfly, the codling moth, the apple curculio, the grapevine flea beetle, the grape berry moth, the strawberry leaf roller and the strawberry sawfly. All of these insects have often been described and are familiar pests in many

of the States to the south and east of us, although they may some of them, be quite new to us. It will only be necessary therefore for me to describe them in general terms and mention such discoveries in regard to their habits and the methods of treating them as have been recently brought out.

THE CHINCH BUG. (*Micropus leucopterus*, Say).

This ill-famed and ill-smelling bug—"chinck bug," as our German and Scandinavian friends call it, has already made a settlement among us in spite of our hopes and predictions that our climate would be too severe for his constitution, especially, since, according to Dr. Shimer, he is predisposed to bronchial troubles. We are not sure, indeed, that our climate will not be a help to him in that respect as it has been to so many biped invalids. However this may be, he shows the same voracious appetite for growing wheat and corn that has for years made him the most dreaded foe of the farmers of Illinois, Kansas, Missouri, and many other states. I have not as yet seen any statistics as to the amount of loss caused in this state by the chinch bug during the last season, but presume that in some sections it was considerable. The habits of this insect may be briefly recounted. It hibernates in straw piles, cornstalks, weeds, under boards, chips, and in rubbish of every sort, remaining dormant until the young wheat and oats are well started. It then makes its way to the roots of the grain and deposits a large number of very minute yellow eggs, from which hatch the little bugs that are at first blood red, but change to brown with a pale band across the back. These pierce the wheat stalk with their little beaks and when there are hundreds on a single stalk they soon exhaust the supply of sap and the plant dies. When one plant is exhausted they crawl to another and often migrate from field to field in the same way. Unlike the insects in higher orders there is no change to inactive pupæ with this species. The pupæ are only distinguished from the larvæ by having the rudiments of wings, and are as active and greedy in this stage as in any other. They require from five to six weeks for entire development, and as the females continue to oviposit for some time, their season is extended for more than two months, and the first brood overlaps the second. A singular fact in the habits of this insect is that although the perfect individuals have large and strong wings they never fly, except at the pairing season. They always *crawl* from one field to

another and afford a singular spectacle when migrating, their armies being composed of little red larvae, large brown larvae, still darker pupæ with wing pads and mature males and females with black bodies and white wings.

The second brood appears in full force in August, and as small grain is then nearly ripe, this brood is most destructive to corn.

As to remedies, nothing very new has been discovered. The careful clearing up of rubbish, burning straw and cornstalks that harbor the insects during winter; rolling the land as late in the spring as is practicable, are among the preventive measures most highly recommended.

The migrations of this insect from one field or part of a field to another are often prevented by a strip of tar poured on the ground or on boards set on edge, about one gallon of tar being used to a rod. One or two deep furrows through which a stone or bundle of brush is dragged every day to keep the soil loose will also intercept the march of the chinch bug army, and vast numbers of them will be killed by the stone and the brush. As this bug is very fond of many other grasses besides wheat and oats, many farmers practice sowing Hungarian grass, or millet, with their small grain to divert the bugs somewhat from the latter; or they surround their fields with a border of these forage crops, on which the bugs which usually begin on one or more edges of the field, will feed until the choicer grain is sufficiently well grown to resist, in a measure, the attacks of the insect. Corn is sometimes saved in the same way by a belt of sorghum. I am informed by our secretary that many of our farmers sow clover with wheat, as the clover keeps the surface of the soil too cool to suit the habits of the bug. If this really has the effect claimed, the discovery is a valuable one, and the knowledge of it should be widely disseminated.

Prof. Forbes, State Entomologist, of Illinois, read a very interesting paper before the Biological section of the American Association for the Advancement of Science in our city last summer, in which he gave an account of a disease that had swept off a large proportion of the "chinchés" that appeared in the spring. This disease was caused by *Bacteria*, and he was of the opinion that it could be widely spread by means of the germs of this *Bacteria* which could be multiplied to any extent in beef-tea and other infusions. This is, as yet, a mere theory, but it may lead to the discovery of a remedy.

As far as this bug is concerned the farmer's main reliance will continue to be in the occurrence of heavy rains in the fall and late

in the spring. In such a season the bugs are sure to be washed away and drowned in such numbers that their injuries to grain will be light, while during dry and warm springs they may be expected to be more or less troublesome.

THE BOLL-WORM OR CORN-WORM. (*Heliothis armigera*, Hubn.)

This is another insect whose powers are not "contracted" by any "pent up Utica." It is in fact known all over the civilized world, and is, as a consequence of its extended range, by no means particular as to the kind of food set before it. Its appetite is not even limited to vegetable products, but it is not averse to an occasional meal off the pupæ of other caterpillars, and it has frequently been caught in the cannibalistic act of devouring the smaller larvae of its own species.

In the southern states its voracity is mainly confined to corn and cotton, while in the northern states its ravages are most severe on corn and certain garden vegetables.

The moth from whose eggs this omnivorous worm, or more properly caterpillar, hatches, is a medium sized, plain looking insect with the fore wings of a pale clay-yellow, sometimes tinged with green, with markings of pale olive and dark gray. The body and underwings are dirty white, the latter with a brownish outer border.

This moth appears rather late in the spring and lays its eggs scatteringly on the buds or ears of the plant it prefers. The caterpillars are quite variable in shade, ranging from pale green to dark brown, and are marked with a number of fine dark longitudinal lines on the back and a pale yellow stripe on each side. They first attack the tassels of corn, boring back and forth through the buds before they have opened, and as soon as the ears have set they feed upon them by preference, eating first the silk, then the kernels in the milk and continue their ravages until the corn is ripe and hard. They go from one ear to another spoiling many that they do not actually devour. They also attack beans, cucumbers, pumpkins and various other garden vegetables. I found them this summer boring into my tomatoes, injuring both the green and ripe fruit.

In some parts of the country they have proved particularly destructive to this vegetable, robbing the market gardeners of from one-third to half the crop. As the presence of this worm is easily detected, the remedy is to go through the field or garden infested

and gather and destroy the ears, buds or fruit in which it is working. The moths may also be trapped in the spring and again in July and August by placing shallow vessels filled with vinegar and molasses among the plants to be protected. This plan is quite extensively practiced in the cotton fields of the South. Turkeys will search eagerly for the worms and pick up great numbers that are about to enter the ground. Chickens also will chase and capture the moths.

THE EUROPEAN CABBAGE BUTTERFLY. (*Pieris rapæ*.)

As I predicted two or three years ago, this insect has invaded our gardens and cabbage fields, and during the past summer was the most serious pest with which we had to contend. The velvety green worms, with faint pink stripes on the sides are probably too familiar to every gardener to need any further description, but it is possible that there are some who do not yet recognise them as the progeny of the clouds of white butterflies that appear two or three times during the summer, and may be seen fluttering about and often alighting on the cabbages. Every one of these which can be caught and killed, if a female, reduces the number of worms from fifty to one hundred. As the flight of these butterflies is low and slow they are very easily caught in a hand net.

A great variety of preparations have been recommended for killing the worms, many of which have no value whatever. The great difficulty is to find a substance that will destroy the insects without injury to the plant. In this respect nothing has been found superior to the California Buhach or Pyrethrum powder, manufactured by Milco & Co. The only objection to this is its costliness. It may be diluted, however, with from two to five parts of flour or air slacked lime, and should always be applied in the evening, as the volatile properties of the powder are not so quickly dissipated at night as they are by the light and heat of the sun. A mixture composed of one part cayenne pepper, two parts sulphur, and three parts air-slacked lime, has been found to do good service. Kerosene emulsions are good, but should be used with care, and followed shortly by a thorough drenching with pure water. A number of formulas for the preparation of these emulsions have been given, of which the following is as good as any: Kerosene, one pint; skimmed milk three pints; water five pints. The kerosene should be first thoroughly mixed with the milk by vigorous shaking or stirring, after which the water may be added. This is

one of the most reliable applications ever discovered for all kinds of bark-lice and scale insects. Small cabbage patches may be saved from destruction, by constant care and attention, but in large fields, that are raised for the city markets, it is almost impossible to fight the worms successfully. The consequence is that cabbage is very scarce in these markets and the price per head three or four times as much as it was a few years ago. There is reason to hope, however, that nature will come to the rescue of the cabbage grower before long, in the shape of parasites or some insect malady. Of the latter, there is indeed already indication. In the January number of the American Naturalist, Prof. Forbes gives an account of a disease which carried off large numbers of the latter broods of worms in Illinois, and Prof. Riley has also observed among them what he calls "black rot." We can but hope that it will prove epidemic.

THE COLORADO POTATO BEETLE.

This once destructive pest has scarcely "put in an appearance" throughout the west for the last year. Entomologists have not decided to what agencies to attribute its remarkable scarcity, but whether due to peculiarities of the season, to the multiplication of natural enemies or to the prevalence of some disease which escaped observation, its absence was a great boon to the potato grower.

THE CODLING MOTH. (*Carpocapsa pomonella*, Linn.)

The apple crop was unusually short and of poor quality throughout the northwest during the past summer, and there was great complaint of the "apple worm" by which, in ninety-nine cases out of one hundred, is meant the larva of the above named moth. No apple grower or apple eater needs an introduction to the fat, pinkish-white larva with black or brown head, which so often takes the fairest fruit upon the tree and gives to cider a more than desirable richness, unless the apples are assorted with the utmost care, and necessitates so much extra labor on the part of the housekeeper in preparing "apple sauce." The parent of this worm is so shy that it is seldom recognized even by those who suffer most loss from the gnawings of its progeny. It is a small and beautiful species of moth of a gray color, with numerous wavy stripes of bronze crossing the wings, and a large spot of burnished bronze near the tips. It cannot be allured by lights or sweetened fluids,

and is seldom seen by daylight. It lays its minute yellow eggs in the blossom end of the fruit and as soon as the worm hatches, it commences to bore toward the core. The first brood of moths appears just as the apples are setting, and the second when the latter are half or two-thirds grown, and there are premature or belated individuals that keep up a constant succession. The first brood of worms seldom accomplishes more than a beneficial thinning out of the fruit, but the second brood is often ruinous to the crop. The remedy is therefore to trap the first brood of larvæ after they leave the fruit, and prevent in a measure the occurrence of the second brood. This is done by means of bandages of hay, rags or paper, which should be put around the tree about the last of May and kept on till the last of August. They should be regularly examined every two weeks, and all worms or cocoons found concealed in them crushed or otherwise destroyed. Several prominent fruit growers have lately adopted the plan of syringing their apple trees with Paris green or London purple in water by means of a force pump and hose with a spraying nozzle. If this is done three or four times during the summer it is claimed that it will prevent the moths from laying their eggs. About a tablespoonful of the poison should be used to a gallon of water. In small orchards the bandage traps are a less expensive and less troublesome preventive.

THE APPLE CURCULIO. (*Authonomus quadrigibbous*, Say.)

A few weeks ago our President, Mr. Harris, wrote me concerning a grub in apples, which he took to be the above named curculio. As this insect is sometimes quite injurious to apples, a few words of description may be devoted to it. It differs from the plum curculio in its somewhat smaller size, its longer and more slender beak, or snout, and in its habit of going through all its transformations *within the fruit*. It is of dull gray and brownish colors, with four rust-red humps or projections on the hinder part of the body. Its punctures in the apple, both for food and for the reception of its eggs, have been compared to those made by a red-hot needle, as they are always rimmed with black. Like the more common apple worm, its larva, which is a humpy and wrinkly little grub, works around the core of the apple, after a time changing to a translucent white pupa from which, in a short time, the beetle emerges and cuts its way out of the fruit. As this species breeds but once a year it is never likely to do such extensive damage as some other apple worms. It can be kept in check by jarring the beetle from

the trees in the summer, and by gathering and destroying the infested fruit.

THE GRAPE VINE FLEA BEETLE. (*Graptodera chalybea*, Illig.)

The foliage of grape vines suffered severely last spring from the gnawings of this handsome but destructive little beetle. It commences its work in the spring on the leaf and flower buds, often cutting off a large proportion of the latter. It also lays its orange colored eggs in clusters on the underside of the leaves, and before the beetles have entirely gone the larvæ begin to hatch. The latter are of a yellowish or brown color, dotted and striped with black and have black shining heads. They are very voracious and riddle the leaves with holes. In about three weeks, having completed their growth, they drop to the ground into which they burrow to the depth of one or two inches and change, in an earthen cell, to golden colored pupæ, from which in two or three weeks the beetles appear. The process of reproduction again takes place, the beetles from this second brood of larvæ being the ones which hibernate. This is a very hardy insect and difficult to destroy except by the severest measures. The most effectual plan for getting rid of it is to jar the first beetles that appear in the spring into cloths spread under the vines and saturated with kerosene. The beetles are most sluggish on cool mornings and will drop readily, and the slightest touch of kerosene kills them. The larvæ may be killed by a much diluted emulsion of kerosene or by syringing the infested leaves with paris green in water, in the proportions of a teaspoonful of the green to a gallon of water.

THE GRAPE BERRY MOTH. (*Eudemis botrana*, Schiff.)

A considerable proportion of grape rot in some vineyards is caused by the workings of the small, slender, greenish larva of this moth. The grapes infested may first be distinguished by having a discolored spot on one side around the open center of which there is often a slight deposit of excrement. The worm works in the centre of the grape and often devours some or all of the seeds. If one grape does not suffice, it works its way into a second, often from mere destructiveness as it would appear; webbing together and spoiling four or five. When the larva is full grown it leaves the fruit and proceeds to the leaves. Here it neatly cuts out a portion of the leaf for a flap, which it folds over itself and fastens down

firmly by the edge. This ingeniously constructed retreat is lined with silk and within it the larva changes to a chrysalis and in this state passes the winter. The moth appears in the spring. It is very small, the expanded wings measuring about four-tenths of an inch. The forewings are of a bluish, leaden color ornamented with dark brown spots and bands. The body is olive brown and the hind wing dark gray with paler fringes.

Miss M. E. Murtfeldt has discovered that in Missouri the first brood of larvæ feed in the tender leaf buds of the Ironweed (*Veronica*) and are never found on the grape. By the time the moths from this brood emerge, the grape berries are well formed and the moth deserts the Ironweed and selects these as food for her young.

The only way in which this insect can be kept in check is to gather and destroy the infested grapes and to burn the leaves in which the pupæ are concealed late in the fall. It might also be advantageous to exterminate all the Ironweeds growing in the vicinity, in the spring.

THE STRAWBERRY LEAF-ROLLER. (*Phoxopteris fragariae* W. and R.)

This is a very wide spread foe of the strawberry plant and often occurs in such numbers as to ruin the beds. The larvæ are found within the folded leaves about the time that the berries begin to ripen. They are about one-third of an inch long when full grown, of a greenish or yellowish brown color with a horny mahogany brown head and a shield of the same color on top of the first point of the body. The golden brown chrysalis is formed within the folded leaves. The moth is about the size of the grape berry moth. The forewings are of a reddish brown color handsomely ornamented with dark brown, black and white. There are two broods each season, the second of which hibernates within the folded leaves in the chrysalis state. It is almost useless to attempt to reach this insect with either powders or liquid applications, so securely is it hidden within the webbed and folded leaves. The best preventive of its injuries is to frequently change the location of the strawberry beds. Mr. Gibbs writes me that he obtained the mastery of it by salting and plowing under the worst infested fields. He has also observed that many of the chrysalids are destroyed in the early spring by birds which search for them through the mulching.*

*See Secretary's Portfolio, for a note on this insect.

THE STRAWBERRY SAWFLY. (*Emphytus maculatus*, Norton.)

This pest of the strawberry plant has also been brought to my notice by Mr. Gibbs, for whom it did much injury last spring on a new bed of the Wilson variety.

The larva of this sawfly is a slender, semi-transparent green slug worm about three-fourths of an inch long which when not feeding rests coiled up on the under side of the leaves. When mature these slugs burrow into the ground to the depth of an inch or so and form a frail cocoon of silk and particles of earth. The flies appear late in July and lay the eggs from which the second brood of slugs hatch in August. This insect is not so common as many other enemies of the strawberry, but is sometimes very destructive. It is however, easily killed with hellebore applied dry or in water. Paris green in liquid suspension may also be freely applied to the second brood in August.

In concluding this paper, I wish to say that ill-health and business demands make it impossible for me to make extensive investigations of the insects occurring in distant parts of the state, but I shall always be glad to have my attention called to them by correspondence, and would suggest that where inquiries are made concerning any species, that specimens of the insects be packed in tin or wooden boxes to accompany the latter.

DISCUSSION OF THE ENTOMOLOGICAL REPORT.

Mr. Latham. There is a steel blue beetle that eats into the buds of the grape. I would like to have it reported on at some future time by our entomologist. As to insecticides, white hellebore is effective if pure.

Mr. Whipple. Only one kind of cabbage worm is treated of in the report. There is another, a long worm, with bright stripes.

Mr. Mendenhall. I think the characteristics of one kind are largely the characteristics of all the rest.

Mention was made by some member, whose name the reporter did not hear, of a new potato bug that threatens to be destructive in Dakota.

Secretary Gibbs. From the description given I presume it is the same bug that Mrs. Underwood mentioned at our meeting in June, 1882, as appearing on her flowering plants. It is a long,

slim, blue-black, genteel-looking, piratical fellow, that comes suddenly, eats voraciously, and disappears quickly. I have seen them attack a patch of mangel wurzel beets and riddle the leaves, by swarms, in one day ; but a weak solution of paris green lays them out expeditiously. It has no such adhesiveness and tenacity as the Colorado potato beetle, and does not threaten to be generally prevalent. I will look it up in the books and identify it in the Secretary's Portfolio, if I can.

Mrs. Sargeant being present was then invited to read her paper.

A BEGINNING IN SILK-WORM CULTURE IN MINNESOTA.

BY MRS. H. B. SARGEANT, LAKE CITY.

Finding myself in possession of some silk-worm eggs in the spring of 1883, I thought the proper thing to do would be to allow them to see the light, and enjoy the term of life allotted them on this mundane sphere. As I had no acquaintance with them, never having seen a silk-worm, I began to look around for some instruction as to the way and manner in which I should receive and entertain my expected guests. I soon found that a book giving instruction on this subject was published by the Woman's Silk Association, at Philadelphia. I procured the book and was enabled to provide for their comfort when they arrived.

The food of silk-worm is the mulberry. Of the mulberry there are said to be some seven or eight varieties. As a vegetable production it is said to be entirely subservient to the wishes of its producer. It will, under favorable circumstances, grow to the height of forty or fifty feet, or, it can be trained as a tall and ornamental shrub or dwarfed to a thick and impenetrable hedge.

It was about the 7th of July last, when the mulberries which had been started the year before promised a supply of food, that I brought the eggs from the cool temperature of 40° and placed them in a room with a temperature between 75° and 80° of summer heat. Just here I would say that the room for these little silk producers must be perfectly neat and clean, free from odors, with

pure air and plenty of light. The eggs may be placed upon tables or shelves and over them a piece of tarlatan or mosquito netting. As soon as they commence to hatch, which may be within twenty-four hours, have ready some mulberry leaves, young and tender, finely cut with a chopping knife. Sprinkle these lightly over the netting.

Immediately on coming from the shell the little worms, less than a quarter of an inch in length, look around for food ; finding which, they remain nearly stationery, never moving save in search of it. Once every day, to take away the dried leaves and the litter which accumulates, a fresh piece of netting is spread over the worms and upon it freshly cut leaves. In an hour or more the worms will have crawled up through the netting, and the remains of yesterday's food can be removed.

The worms hatched each day must be kept by themselves. After the third day, the worms are said to be weak and feeble and not worth raising. The little worms must be fed as often as once in two or three hours. The amount they eat depends largely upon the temperature of their room. If the temperature goes below 75° they eat but little, and if they do not eat they will not spin silk sufficient to make themselves a decent shroud.

As the days are added to their age so their food must be increased. Their whole life is less than forty days; and during the last two weeks they devour an enormous quantity of food, considering their size. As the amount of their life's work depends upon the quantity of food consumed, together with the temperature in which they are kept, they have been known to have finished this work in twenty-five days. Generally, they live from thirty to thirty-five days. In their living and eating and changing of clothing they do not differ from other species of the same class which we instinctively shrink from in dismay.

But these creatures we treat differently. Plenty of food and the best of care are not grudged them; for it is the last act of their short lives which is the most wonderful of all. The worms, when first hatched, are nearly black. In about five days they shed this skin and appear in a lighter one. This change of skin occurs at intervals during their lives. Each time the skin is lighter than the preceding one. After the last change the worm is of a pearly whiteness, and smoother to the touch than the finest satin that comes from the looms of the silk weavers. It is also nearly transparent. The food has been converted into silk fluid and is ready to be spun. The worm at this stage is from three to four inches long.

The time has come when the fresh green leaves have no attraction for them. They move their heads from side to side and appear to be looking for something. That something is a place upon which to build their tomb.

Wisp of straw or bunches of twigs are laid upon the tables. The worms soon find them, and crawl up till, finding a suitable place they attach to numerous twigs threads to support the cocoon. Then the worms begin to spin the continuous silken thread which forms their precious little nests. They arrange the thread all around the body, describing ovals with the head. In a few hours they are surrounded with a thin gauze of silk, through which they can be seen working for dear life or death, which? After a few hours more the worms have completely hidden themselves from view; the threads have been woven thick and close, over and over each other, until the gathered treasures of their short lives have been expended. They fold themselves within their beautiful winding sheets and wait the life beyond.

A worm spends three or four days in spinning its cocoon, though all do not commence spinning at the same time. Some are longer in finding a good place, others, having found a place and made a beginning, fall back on the table, and are obliged to start anew. It is very interesting to watch them at their work. They do not seem to be exempt from the trials and perplexities of more intelligent creatures.

Four days after the last cocoons have been spun they must be gathered. The firmest and best are placed in a partially darkened room; and the others, which are to be reeled for silk manufacture, are placed for about 30 minutes in an oven sufficiently warm to stifle the chrysalides. When this has been accomplished, the cocoons are placed upon tables to dry or are immediately reeled into skeins and made ready for the looms or other uses to which the silk is applied.

The imperfect cocoons together with the floss silk which surrounds all the cocoons, are carded and spun at factories and mixed with wool fabrics. The worms which produce white cocoons are the best; the silk is stronger and has more lustre.

Now, to return to the worms, which we left in the darkened room. In from 12 to 15 days the chrysalis will put aside the silken fibres of its tomb, and come into the world a full-grown miller. The silk-worm miller is of a creamy whiteness, and measures nearly an inch and a half across the wings from tip to tip.

Male and female they arrive here as in the days when God created the first pair. Equal in size they seem to be equal in intelligence, with the same duties, privileges and responsibilities. Therefore, it is presumable that they are equal suffragists.

When the females are ready to deposit their eggs they are placed upon small pieces of cloth or paper, about five inches square. The number of eggs deposited is from seven to eight hundred. The eggs laid the first three days only are good. After that time the millers may be thrown away. The eggs must be kept in a cool, dry place, safe from mice, spiders, and the like, till another summer brings the mulberry leaves.

I have thus far related my short acquaintance with these little creatures. I hope another year to make a closer study of their manners and customs.

Silk culture is a very ancient industry. The Chinese claim the honor of the discovery of the silk worm and of the subsequent utilization of its fibre. I must particularize and add, that the mode of raising and feeding the worms, and the different processes of converting the fibre into cloth, was a spark from a woman's brain. Also that the princesses of royal blood, and ladies of noble families only, were allowed to raise the worms and weave the queenly fabrics.

In eastern countries, where the industry has been carried on for many centuries, the women and children care for the worms, reel the silk, and prepare it for the looms. About fifty years since, silk culture was attempted in this country, but for some reason it proved a failure. Statistics show that \$15,000 worth of raw silk is consumed annually by the home market, nearly all of which is of foreign importation.

The silk industry does not require an expensive outlay. The mulberries can be grown in hedges and be made to occupy a comparatively small space. The trees can be furnished by any nurseryman and the silk-worm eggs are easily procured. The Woman's Silk Culture Association furnish books which give complete instructions for raising the mulberry and for educating the worms; also for reeling the silk and preparing it for market.

The reeling of the silk is considered of the utmost importance. In countries where the silk industry is extensive, silk-reeling is sometimes conducted as a separate business. The Woman's Silk Association at Philadelphia offer two kinds of reels—one made of wood for \$20, another made of metal and complete in all its appointments for \$65. The reeled silk brings from \$4 to \$7 per pound,

according to its grade. I am unable to give very exact figures with regard to prices and profits; but the whole year's labor, leaving out the reeling, could be finished within fifty days, so that if the profits were not immense the labor would have been in proportion.

Now as a woman originated the industry, as women have hitherto, in the old world, carried it on, American women can continue the work. Women of means might establish filatures for reeling and factories for the weaving of silk in towns and cities, and many women and children who can perform only light labor can spend their time pleasantly and profitably in rearing silk-worms.

Col Stevens moved that a vote of thanks be tendered to Mrs. Sargeant for her interesting and practical paper, and that, as in the case of Miss Manning, we elect her an honorary life member, and that she be invited to favor the society with reports of her continued experiments in silk worm culture.

The motion was unanimously adopted.

Samples of cocoons grown by Mrs. Sargeant were distributed among the audience.

A member asked, have we the mulberry that Mrs. Sargeant speaks of as the proper food for the silk worm?

Several answered, yes—the Russian Mulberry.

R. Porter. Can the Russian mulberry be fruited in Minnesota?

Col. Stevens. Yes, in three years. It grows readily from cuttings.

Mr. Emery explained the habits of growth of the mulberry by a diagram on the blackboard. It is now being planted in the Northwest by the million, and will supply an unlimited amount of food for silk worms, as well as a really desirable fruit for family use.

Secretary Gibbs then presented the following:

REPORT OF DELEGATE TO THE AMERICAN POMOLOGICAL SOCIETY.

Mr. President and Fellow Members:

At the time of my appointment as delegate, on the 8th of August, the Executive Committee had before them an estimate of four hundred dollars as the probable maximum expense of the collection

and exhibition of our fruits ; and with this estimate in view I was authorized by unanimous vote of the committee, to make the display as complete and creditable as the time, the condition of the fruit crop and the funds at disposal would allow.

The following is the expense bill :

Collecting and forwarding fruits at home.....	\$ 83.84
Expenses to Philadelphia and return.....	147.50
Cash paid J. T. Grimes, time and expenses on grapes.....	28.45
Time in collecting fruits, August 8th, to September 7th.....	80.00
Use of team.....	20.00
Total	<hr/> \$359.79

This bill has been approved by the Executive Committee and paid by the treasurer.

As appears elsewhere in the proceedings of the Executive Committee and in the report of the treasurer, two hundred dollars of this outlay was contributed by the Governor from his contingent fund, leaving the cost of the representation of our society at Philadelphia and the exhibition of the fruits, \$159.79 to the regular funds of the society.

A survey of the condition of the fruit crop in the state, made previous to the meeting of the committee, showed that, disasters excepted, a few specially favored localities could be depended on for a good collection ; but at the same time it was further apparent that, notwithstanding the promise of the spring, it was the off year for apples in Minnesota, as it was almost everywhere else, and if the fruit to be taken to Philadelphia was to be anything like a general representation of the large list of varieties grown, it must be collected by a careful and laborious search in several counties. Circulars calling for fruit and for information as to where it could be obtained, were immediately printed and sent to the state press, members of the society, and others, and from the time of my appointment to the 7th of September, when I was obliged to leave with the fruit for the east, my entire time was devoted to the getting up of the collection. Some promising localities were left unvisited for want of time, and some of our best and handsomest varieties, especially new seedling apples, were left behind for want of time to go after them. As it was, I succeeded in getting together about twelve bushels of apples representing about one hundred and forty distinct varieties, without including a single one that was inferior, and, with the assistance of J. T. Grimes, who attended mostly to that matter, about thirty kinds of grapes, and a

few native plums. The plan pursued was to first ascertain where the fruit could be obtained, put the early sorts already mature, into the best condition to resist decay, leave the later sorts ripening to the last moment on the trees or vines, then go and gather them up and hurry them through to the rendezvous with all possible dispatch and care. The specimens of apples, numbering from three to four thousand in all, were each wrapped in single papers, and wherever necessary to insure identity, each variety group was re-inclosed in separate paper bags. The grapes and plums were laid in cotton batting, and packed in baskets by themselves. Success in showing fruit in public exhibitions, where you get into the hands of competent judges, depends very largely upon condition, which governs the appearance of each sort and the general expression of the whole. This also depends upon judgment as to the proper time to pick each sort and upon the utmost delicacy in handling, and afterwards close packing for transportation. There are so few growers who realize all this fully, that it is useless to touch a collection sent in, as a rule, by growers. It must be picked, packed and transported by experts. Much that was sent me was entirely off condition before it reached Lake City, and of course had to be rejected. Some fruitless journeys were made. It was not enough to find the variety one was looking for; if the one in hand was not probably the best sample of its sort to be found, then the search must be continued. This in the off year was laborious and expensive. But there were other journeys made to places where there was little expected, that turned out rich in fruits and in points of valuable information, which the society will get the benefit of in one way and another.

I will stop and say right here that we little know what mines of wealth are to be found in the experiments that have been made in fruit growing in various parts of our state by farmers and others who have heretofore had no visible connection with our society, especially in the production of seedlings and in the importation and trial of foreign sorts. Some of these mines have been or will be opened at this meeting.

In presenting the following list of contributors and their fruits, it is but an act of simple justice for me to make mention of the two leading growers of the apples and the grower of the Minnetonka grapes. Underwood & Emery, of Lake City, turned me loose in their orchards of perhaps 3,000 bearing trees, and left me to sample up without limit. Charles Ludluff, of Carver, not a nurseryman, but a plain farmer, did substantially the same. This man probably

grows more varieties of apples than any other person in the state not a nurseryman. I think in a favorable season for fruits we could draw on him for over one hundred sorts of apples and almost no end of grapes, cherries and plums. A. W. Latham, of Excelsior, who grew the best grapes of our collection, having a very favorable location, gave his vineyard extra care with special reference to filling out this department of our exhibit. Without these three contributors the success our effort achieved would have been impossible. Others did the best they could, and are entitled to full credit and the thanks of the Association.

I ought also to mention the Rochester fruit growers. Their place is blank in the list. Their extensive orchards were not all in the direct line of the tornado of August 21st, but the flanking gales of it so prematurely harvested and bruised all their apples that after careful search there and elsewhere in the vicinity, in company with Charles Gibb, of Canada, who was in quest of the Russian fruits, I could not find a single specimen of any variety of apples fit to show. So great had been the destruction and injury to fruits in and around Rochester that I was applied to by the Secretary of the Southern Minnesota Fair Association of that city to furnish a collection of apples to supply the deficiency in that section for their fair, the second week in September; and on the eve of my departure for Philadelphia I shipped to him, to be turned over to and exhibited by Mr. Sias, something over a barrel of carefully wrapped specimens embracing over fifty varieties of apples, fresh picked and perfect, including a set of entries of my own growing and duplicates of the Philadelphia collection, and directed Mr. Sias that the premiums awarded, if any, be donated to the Association.

The Rochester fruit growers, in a favorable season, will come in with a very large list of varieties, many of them novelties not to be found elsewhere. In all Minnesota collections of fruit got up at present, there will be vacant chairs that must be regretfully noticed, when we do not find the names of Sias and Jordan, and looking down the list also we fail to discover the name of that other veteran of the apple fairs, and winner of premiums on big collections, J. S. Harris, of La Crescent. His Bailey Sweets, his Seeknofurther's, his Jonathans, his Northern Spys, you shall not find them in the list, not even their names, though you search for them carefully and with tears. Like Antony, in his oration, I want to pause and weep to think of the Wilder medal coming to Minnesota without an apple in the lot from him. During his searches of apples for the State Fair, his reports to me were

so discouraging from the southern and southeastern parts of the State that I did not deem it worth while to visit these sections.

It would be interesting to know how many varieties of apples are fruiting in this State. Our people have come from all quarters of the globe. The most of them have brought their favorite varieties with them, and of almost every sort planted there is some survivor. In an apple year I think we could find three hundred sorts, and possibly twice that number, if we include unnamed seedlings.

The following is a list of

CONTRIBUTORS AND THEIR FRUIT.

APPLES.

Underwood & Emery, Lake City.

Dutchess.	Deoria.
Yellow Transparent.	McIntosh Red.
Tetofski.	White Winter.
Pickett's No. 5.	Homestead.
Conical.	Talman Sweet.
Roman Stem	Quaker Beauty.
Scott's Winter.	Utter.
Beecher Sweet.	Russian No. 410.
Peach Apple.	" 985.
Orion.	" 978.
Hyslop.	Early Strawberry.
Hesper Blush.	Whitney No. 20.
Drake.	Orange.
Alexander.	Fameuse Crab.
Fameuse.	Bailey's Crimson.
Meador's Winter.	Northfield Beauty.
Russian No. 161.	Boomer Crab.
" 565.	Sweet Russett.
" 984.	Fall Orange.
Wealthy.	Walbridge.
White Astrachan.	Gideon No. 7.
Moscow.	Haas.
Plumb's Cider.	A. S. Winter.
Odell's Seedling.	Price's Sweet.
Smith's Favorite.	Russian No. 413.
Jewell's Sweet Banana.	Russian No. 968.
Jewell's Red Winter.	Minnesota.

Geo. Bartron, Lake City.

Angular.	Maine Blush.
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Charles Gould, Central Point.

Duchess.	Wealthy.
Haas.	Transcendent.
Orion.	Plumb's Cider.

Baker Harrison, Central Point.

Hass.	Price's Sweet.
Fameuse.	Talman Sweet.
Utter.	Plumb's Cider.

R. L. Cottrell, Dover Center.

Duchess.	Talman Sweet.
Sops of Wine.	Orange.
Hyslop.	Lady.
Meador's Winter.	Pear Apple.
Hutchison's Sweet.	Fameuse.
Haas.	General Grant.
White Pigeon.	Cherry Crab.
Transcendent.	Tetofski.
Maiden Blush.	Russian Unknown.
Charlamoff.	Red Astrachan.

Sidney Corp, Hammond.

Duchess.	Wealthy.
Elgin Beauty.	Rollins' Pippin.
Anis.	Rollins' Russet.

G. A. Cook, Cook's Valley.

St. Lawrence.	Seedling Apple.
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Charles Ludluff, Carver.

Peffer's Sweet.	Russian No. 385.
Hyslop.	" " 565
Boyce.	" " 585
Duchess.	" " 978
Akin's Green Winter	Greenwood.
Grimes' Winter.	Winsted Pippin.
Pewaukee.	Gen. Grant.
Yellow Siberian.	Orion.
Briar's Sweet.	Sylvan Sweet.
Montreal Beauty.	Allen Crab.
Barkeeper.	Rollins' Prolific.
Summer Sweet Crab.	Ashfieldt.

Robinson's Seedling.

Plumb's Cider.

Russian No. 984.

" " 563

" " 387

Early Strawberry.

Orange.

Northfield.

Minnesota.

Minneapolis.

North Star.

Rollins' Pippin.

Sweet Russet.

Maiden's Blush.

Quaker Beauty.

Rembacker.

Dahlgren.

Minn. Stripe.

Peffer's No. 1.

Malinda.

German Rambo.

Russian No. 378.

" " 762

Cinnamon Crab.

Lake Winter.

Wetsig's Winter.

Transcendent.

White Pearmain.

Haas.

Coral Crab.

Horst.

Molly.

Wealthy.

Gibb Crab.

Whitney No 20.

F. W. Miller, Lake.

Duchess.

Conical.

Fall apple, name unknown, a Russian.

Wealthy.

Minnesota.

Plumb's Cider.

Walbridge.

John Fletcher, Lake City.

American Golden Russet.

Talman Sweet.

Yellow Muscovite.

J. C. Stout, Lake City.

Talman Sweet.

G. M. Dwelle, Lake City.

Red Astrachan.

Transcendent.

Fameuse Crab.

Duchess.

Virginia.

Ben Davis.

St. Lawrence.

Quaker Beauty.

Hyslop.

G. W. Fuller, Litchfield.

Wealthy.

Duchess.

Beecher Sweet.

Transcendent.

W. J. Hahn, Lake City.

St. Lawrence.

Plumb's Cider.

Perry Russet.

Golden Russet.

Ben Davis.

Saxton.

M. C. Bunnell, Newport.

Duchess.	Wealthy.
Hyslop.	Utter.
Transcendent.	

W. E. Brimhall, St. Paul.

Duchess.	Wealthy.
Gideon Crab.	

Dr. C. W. Crary, Lake City.

Perry Russet.	Unknown winter apple.
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Oliver Gibbs, Jr., Lake City.

Duchess.	Transcendent.
Walbridge.	Early Strawberry.
Belvidere.	Price's Sweet.
Whitney No. 20.	General Grant.
Orange.	Utter.
Moscow.	Haas.
Maiden Blush.	Conway Sweet.
Wealthy.	Hyslop.
Minkler.	Beecher Sweet.
Talman Sweet.	Quaker Beauty.
A. S. Winter.	White Astrachan.

Mrs. Cutler, Central Point.

Fall apple, name unknown.

John Benson, Lake City.

Utter	Fall apple, name unknown.
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Samuel Doughty, Lake City.

Seedling Winter apple.	Perry Russet.
American Golden Russet	

Geo. Patton, Lake City.

Two varieties seedling apples.

A. W. Fountain, Frontenac.

Two varieties seedling winter apples.

Wm. Forster, Chatfield.

Forster's Red Winter.	Winter Sweet.	Fall Seedling.
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Andrew Peterson, Waconia.

Russian No. 70, Winter Pear.	Russian No. 240 Lieby.
" " 262, Charlamoff.	" " 378, Hiberna'.
" " 410, Little Seedling.	" " 472, Ostrekoff Glas.

GRAPES.

R. Knapheide, St. Paul.

A number of varieties of grapes—names lost or mislaid.

B. Rueideger, Carver.

Eumelan.	Delaware.
Moore's Early.	Morning Pride.
Northern Muscadine.	Talman.
Massasoit.	Seneca.
One variety not named.	

A. W. Latham, Excelsior.

Concord.	Lady.
Talman.	Worden.
Rogers No. 3.	Iona.
Black Hawk.	Delaware.
Brighton.	Telegraph.
Cottage.	Rogers No. 15.
Eumelan.	Moore's Early.
Perkins.	Hartford Prolific.
Roger's No. 9.	Roger's No. 39.
North Carolina.	Janesville.

PLUMS.

Underwood & Emery, Lake City.

De Soto.	Forest Garden.
Weaver.	

Charles Ludluff, Carver.

Native plums—number of sorts unknown.

R. Knapheide, St. Paul.

Native plums—number of sorts unknown.

Recapitulation of Varieties of Apples.

Alexander.	Maiden Blush.
Akin's Striped Winter.	Montreal Beauty.

Anis.	Minnesota.
Akin's Green Winter.	Minneapolis.
Allen Crab.	Minnesota Stripe.
Ashfield.	Malinda.
Angular.	Molly.
Beecher's Sweet.	Minkler.
Bailey's Crimson.	Northfield Beauty.
Boomer.	North Star.
Boyce.	Orion.
Briar's Sweet.	Odell.
Barkeeper.	Orange.
Ben Davis.	Pickett's No. 5.
Belvidere.	Plumb's Cider.
Charlamoff.	Price's Sweet.
Conical.	Peach apple.
Cherry Crab.	Pear apple.
Coral Crab.	Peffer's Winter.
Conway Sweet.	Peffer's Sweet.
Duchess.	Pewaukee.
Drake.	Peffer's No. 1.
Deomia.	Perry Russet.
Dahlgreen.	Quaker Beauty.
Early Strawberry.	Red Astrachan.
Elgin Beauty.	Roman Stem.
Fameuse.	Rollins' Russet.
Fameuse Crab.	Rollins' Pippin.
Fall Orange.	Robinson Seedling.
Forster's Red Winter.	Rembacker.
" Sweet.	Scott's
" Fall Seedling.	Smith's Favorite.
Gideon No. 7.	Sweet Russet.
General Grant.	Sops of Wine.
Grimes' Winter.	St. Lawrence.
Greenwood.	Summer Sweet.
German Rambo.	Sylvan Sweet.
Gibb Crab.	Saxton.
Golden Russet.	Talman Sweet.
Gideon Crab.	Transcendent.
Hyslop.	Utter.
Homestead.	Virginia.
Haas.	Wetsig's Winter.
Hutchinson Sweet.	Wealthy.
Horst.	White Winter.
Hesper Blush.	Whitney No. 20.
Jewell's Sweet.	Walbridge.
Jewell's Red Winter.	White Pigeon.
Lady.	Winstead Pippin.
Lake Winter.	White Pearmain.

Meador's Winter.	Yellow Transparent.
Moscow.	" Muscovite.
McIntosh Red.	" Siberian.

RUSSIAN APPLES--AGRICULTURAL DEPARTMENT LIST, 1870.

No. 70.	No. 563.
No. 161.	No. 565.
No. 240, Lieby.	No. 584.
No. 262, Cahrlamoff.	No. 585.
No. 385.	No. 962.
No. 383, Hibernial.	No. 968.
No. 410, Little Seedling.	No. 978.
No. 413.	No. 935.
No. 472, Ostrekoff Glas.	

Unnamed seedlings and unknown varieties, about 20.

Fortune favored us in every respect from the time our fruit left Lake City till the exhibition was done. The fruit arrived at Philadelphia promptly and in good condition. I could not help comparing this good luck with the misfortune of some other exhibitors from distant points, who spent a good share of their time running to the express offices and back and telegraphing to hear from their fruit, which arrived only by piecemeal, when it did come, and some packages not at all, and some in broken packages and in bad order. Ample room had been reserved for our display by the Pennsylvania Horticultural Society in their spacious hall, by whom also an abundance of plates and dishes, both great and small, was supplied, together with all the help needed to put it up. A bushel each of the Duchess and Wealthy was placed side by side at the centre of the main table assigned us, and the rest of the apples were so arranged so as to give the best effects as to contrast in color, and ranging in size from the larger ones at the center down to the crabs, through all their gradations, to the ends of the tables. The grapes and plums occupied a side table near by. Over all were hung printed placards bearing the words :

Minnesota ♦ State ♦ Horticultural ♦ Society.

140 Varieties of Apples and 30 of Grapes.

and among the plates were placed the names of all the growers and their post office addresses on smaller cards. These cards were all picked out and carried away by the visitors.

The grapes were not fully ripened, owing to slow growth in the extraordinary cold summer of 1883, and many of the apples came short of their full beauty of color for the same reason, having been picked, some of them two to six weeks before maturity ; but upon the whole, with the large size, perfect form, bright, healthy look of all the fruit and the perfect finish and color of such sorts as were fully ripe, the collection was very beautiful, and established in the minds of all beholders the unrivalled adaptation of our Minnesota soil and climate to the production of the northern fruits in their highest excellence. Let me not be misunderstood here. I did not exhibit these fruits with any claim that the varieties of trees producing them were all hardy and profitable; I was careful to represent the facts as they are—that we have as yet among all the sorts we are fruiting but few really hardy ones; but I felt proud to show, and it was a great satisfaction there to pomologists to learn, that we had this much of certainty in our fruit growing, beauty and quality, and that these great requisites to profitable horticulture were to be seen to the best advantage in our very hardiest sorts, such as Duchess and Wealthy. I think the Duchess exhibited in this collection were the finest in color, I ever saw. There was nothing approaching them in beauty in the entire exhibition of apples. And the Wealthies wanted nothing but a little more time in orchard to paint and varnish their faces in the autumn sun to be the superiors in beauty of their earlier ripening neighbors, the Duchess.

One thing familiar enough to us, but seemingly new to the visitors at this exhibition, was the fact that we had got so much of the quality of the apple into our little crabs, in our experiments in fruit growing out here in the West. Our Whitneys No. 20, our Early Strawberry, our Beecher's Sweet, Briar Sweet, Sylvan Sweet, Sweet Russet, Angular, Orange and many others were a surprise to them. Having abundance of samples it was an amusement to note the pucker in the mouths of committees and visitors, which the sight or touch of a crab would give them, from their idea of crab quality, and then take it out and substitute the astonished and satisfied expression that followed the tasting of a Whitney, a Beecher Sweet, a sweet Russet or an Angular crab. There were many novelties on the table, found in the search for these fruits—varieties heretofore unknown to this society—new seedlings

—Russian Apples, etc., etc. I will not take time to describe them here. They will come in for notice elsewhere in our proceedings.

The result of the exhibition was that we were accorded by unanimous judgment of the committee the honor of having the largest and best collection of apples at the meeting and awarded the Wilder medal on our general collection of fruit.

The Duchess apples of the central stack were selected by a committee of the Pennsylvania Horticultural Society and entered by them and awarded a first premium on their part in the name of Charles Gould, of Central Point, who grew the best ones; and the same committee also entered our grapes and gave them their second premium offered for best twenty varieties in cut bunches in the name of A. W. Latham, of Excelsior.

In regard to the proceedings and discussions of the American Pomological Society, the meetings being held in a room separate from the exhibits, I only attended to those portions that I deemed of most interest to the West, but spent the most of my time where I thought I could do the most good, at the tables of our fruit. The hall was constantly thronged with visitors, day and evening for three days—the Minnesota fruit was an object of great interest, and though as in all such places, there is considerable repetition in the information imparted, as with a lecture on wax works and things, I did not regret the time or the effort. I was a representative of the State for the nonce, and of the Northwest, too, for that matter, and did what I could for it. Opportunity was found in the debates, however, to place our Wealthy and some others of our best varieties of fruits fairly upon the record, and at the banquet which closed the meeting, and which was given to the American Pomological Society by the Pennsylvania Horticultural Society, your delegate in responding to the toast assigned him "The Pomology of the Northwest," gave the outlook of the fruit interest of a somewhat larger territory than our State alone, but of a part of which at present, certainly that part of it to the Northwest of us, we are the headquarters and the source of light on the subject.

The points of principal interest in the debates will be carefully abstracted and furnished for our annual report, together with various items of information in horticulture obtained in the extension of my trip to Washington, and to the New York experiment station at Geneva, and I will print also the final resolutions of the meeting and the new rules of the American Pomological Society to govern future exhibitions, to which they desire to invite special attention of kindred societies. To the resolution which

relates to hospitalities, I desire to add on my own account the warmest acknowledgments you can think of, to the members of the Pennsylvania Horticultural Society and to the citizens of Philadelphia, for the many courtesies received. The half days carriage ride about the city, the visit to the public buildings, the art galleries, the Central Park and Girard College, and the banquet at the new Union League Club House, Friday evening, September 14th, are all very pleasantly remembered.

One of the disappointments of the meeting was the absence of the President, Hon. Marshall P. Wilder, and the expected pleasure denied some of the delegates and members of making his acquaintance there. This was the greater disappointment to me from my knowledge of the fact that had it not been for his efforts to have us represented there, our fruits would probably never have been collected, and possibly no delegate have gone; and I was anxious to have him see our fruits and enjoy them. Early in the winter I sent him a box of our Wealthy apples for inspection, with the compliments of the Minnesota State Horticultural Society, and received the following letter of acknowledgment:

LETTER FROM PRESIDENT WILDER.

DORCHESTER, MASS., Dec. 4th, 1883.

My Dear Sir:

Thanks ! thanks ! for the box of apples which have come to hand and mouth in most perfect condition. I am surprised with their beauty and excellence, and shall exhibit a dish of them next Saturday before the Massachusetts Horticultural Society. Minnesota was much honored by the exhibition of her fruits at the session of the American Pomological Society, in Philadelphia, which I very much regret that I could not have seen. If Minnesota, though far to the north, can produce such fruits, she will at least, in apples, be able to compete favorably with the most favored states of the Union, and her government could not do a better thing than to foster and encourage the cultivation of fruit wherever it may succeed within its jurisdiction, and I hope that Minnesota will come up with fruits, and what is better still, with her noble men, in full force, at the meeting of the American Pomological Society in Michigan, in 1885, and may I be there to give them a hearty welcome.

The Wilder Medal, which your State so richly merited for its exhibition at the late meeting of our society, will soon be engraved and forwarded to you.

MARSHALL P. WILDER,

Pres't American Pomological Society.

OLIVER GIBBS, JR., ESQ.,

Secretary, &c., &c.

In conclusion I will say that in paying the membership contribution at the meeting, I did so with the understanding that it placed our society officially on the roll, and the society will hold the membership and receive the transactions when published.

One word about the next meeting of the American Pomological Society.

President Wilder has told you in the above letter where it is to be held.

I hope our society will resolve at this time to be represented there, and make timely preparation for it, and if nature favors us with a good crop of fruit in 1885, we may, even if we should not win another medal, at least show that we still have something to justify our holding the one we have got.

And now, Mr. President, and fellow members of the Minnesota State Horticultural Society, here is your certificate of the award, which I will read :

CERTIFICATE OF AWARD.

AMERICAN POMOLOGICAL SOCIETY, }
 SECRETARY'S OFFICE, AGRICULTURAL COLLEGE, }
 Lansing, Mich., Sep. 15. 1883. }

Mr. Oliver Gibbs, Jr., Secretary Minnesota Horticultural Society.

DEAR SIR :—This will inform you that at the recent meeting of the American Pomological Society, the committee on the awarding of prizes, unanimously gave a silver medal to the Minnesota State Horticultural Society, for its collection of apples and grapes. This is the highest award given by the society. Your show of fruit was a surprise to most of the members from the south and east, and was excellent. Only four Wilder medals in all were awarded at this meeting.

Truly yours,

W. J. BEAL,
 Secretary.

And here is your medal. It was fairly won. It was given us with many compliments from the committee and members and with hearty good will. It was not begrudged to us by anybody. If it shall encourage our own people to look up and appreciate the advantages we possess in fruit growing as well as the exhibit convinced the public at Philadelphia, and if it shall stimulate us to press on and overcome difficulties and obtain other advantages, till we make apples, and pears, and cherries, and plums, and other

fruits, staple crops for money and comfort in the Northwest, I shall be satisfied with my share in obtaining it.

OLIVER GIBBS, JR.,
Secretary and Delegate.

Lake City, Minn., Jan. 5th, 1884.

POSTSCRIPT TO THE FOREGOING REPORT.

Appended here is an extract from the Delaware County Record, published at Media, Pennsylvania, which is a fair sample of both public and private comments on our exhibit from eastern stand-points:

"The Minnesota State Horticultural Society was notably represented by an exhibit of 140 varieties of apples; 30 varieties of hardy grapes and a collection of wild plums. The entire collection of apples showed a perfection of form and smoothness of skin most remarkable, especially when it is remembered how difficult a task it is in Pennsylvania to grow really well-formed, ripe apples. Each variety and indeed each specimen gave demonstrable proof of the adaptability of Minnesota soil and climate to the growth and development of all kinds of hardy fruit. One variety, named the "Wealthy" was especially fine, being a prolific bearer, perfectly hardy and an admirable keeper. Even the dwarfish crab apples grow to a large size and develop a rich flavor and saccharine, juicy taste. The "Duchess of Oldenburg," popular everywhere, was exhibited to great perfection, and in form and color was all that could be desired. The exhibit was the finest of its class made, and reflected great credit on the Horticultural Society of Minnesota, no less than on the climatic conditions of a State which could produce such choice fruit.

"In this collection A. W. Latham, Excelsior, Minn., exhibited 20 varieties of hardy grapes; an excellent exhibit."

The medal was then presented to the President and through him to the Society. It is of silver, enclosed in a velvet and leather case; its diameter is about two and a half inches. Upon one side is a medallion portrait of President Wilder, with the inscription around the portrait: "American Pomological society. Founded 1848. Marshall Pinckney Wilder, President." On the other is the inscription, "Minnesota Horticultural Society, for collection of apples and grapes, 1883." Surrounding this is a rich wreath of fruits and flowers, the whole forming a beautiful as well as a durable medal.

C. L. Smith then offered the following resolution:

Resolved, That the Minnesota State Horticultural Society hereby tenders a vote of thanks to Secretary Oliver Gibbs, Jr., for his care, skill and excellent judgment in collecting, handling and exhibiting the fruits of this State, at the meeting of the American Pomologi-

cal Society, and for his faithful representation of this Society and the State at said meeting.

After remarks by several members, the resolution was unanimously adopted.

Col. Stevens. I move also that the thanks of the State Horticultural Society be tendered to the several gentlemen who contributed fruit for exhibition at the recent meeting of the American Pomological Society, by which contributions the Society was awarded the highest premium for fruits by the said American Pomological Society.

This motion was also unanimously adopted.

Secretary Gibbs. Now, Mr. President and fellow members, I have a resolution to offer in relation to this medal. It was firstly the gift of President Wilder to the American Pomological Society. He authorized its committee to award sixteen silver medals to be furnished and engraved at his expense. The committee thought best to divide the exhibits of all fruits into four groups, and award only one medal on each. To us came the award on apples primarily, but including our grapes, as ours was the second best, display in this department. How much you and the State are indebted to this noble pomologist for the medal is not expressed in the facts here given—hardly a hint of it. It was to his encouragement given to your Secretary, perhaps to others of our membership by many letters—his letters to the Governor of our State, and I know not to whom else—his determination that Minnesota should be represented at Philadelphia, none the less all other States—his large-heartedness and broad views that unselfishly took in the whole continent, all that was American, under whatever flag; that would have been cosmopolitan and embraced the fruits of the people of all nations, had the society given this scope—his zeal that would not tire, however those he sought to help might be inclined to falter in their own cause;—it was this that put Minnesota into the meeting with her fruits. I cannot tell you all the steps and details of his influence. I only know that without it we should never have had a bushel of fruit at that exhibition; and Minnesota would have been regarded to-day as she was in public estimation six months ago, as a country where you can raise wheat. but not apples, and this medal would have been at this time the subject of a pow-wow in a state a good many degrees further south and west—a state which may dispute our claim to a similar award in 1885, but by fair and generous rivalry. I move, therefore, that the thanks of this society be conveyed to

President Wilder for this medal, and for his fatherly care for the pomological interests of the State of Minnesota, which he has done so much to promote in many years gone by, and that we express to him our hope and wish that life and health may be spared to him to meet with us at the next session of the American Pomological Society in 1885. that we may greet him there and show him by our presence and our exhibits of fruit that we are profiting by his teaching and his example.

The motion being seconded, was carried by an unanimous and hearty vote.

The following resolution was presented by the Secretary :

WHEREAS, This society is doing business with funds donated in part by the State, and whereas, it is desirable that the state officers and members of the Legislature should have a more convenient opportunity to mingle with us at our meetings, and to examine the horticultural productions that we exhibit, particularly our Minnesota fruits ; therefore,

Resolved, While keeping our home at the Agricultural College in Minneapolis, and continuing to hold our summer meetings here, that hereafter our winter meetings, occurring in the years of the sessions of the Legislature, be held at St. Paul in the room tendered us for that purpose by the Governor.

The resolution was unanimously adopted.

The subject of the World's Industrial and Cotton Centennial Exhibition, at New Orleans, being presented for consideration, Truman M. Smith moved that members be requested to raise and select the finest fruits possible for the Horticultural Department of this exhibition, and be ready to contribute them if the State should decide to be represented there. The motion was adopted.

M. C. Mesmer then read the following :

REPORT OF RUSSIAN APPLES AND OTHER FRUITS TESTED IN CARVER COUNTY.

BY ANDREW PETERSON, WACONIA, MINN.

To the Minnesota State Horticultural Society :

I promised your secretary that I would give my experience in fruit raising, but on reading your report of 1883, I have found the records of so many fruit growers who have done more than I have, that I need say but little.

It was in the year 1857 that I began to plant fruit trees in Carver county, and I have planted more or less, nearly every year since that time, but without much success until I began with the Russian varieties, which seem hardy enough for the Minnesota climate. Of the seventy other varieties I have tried, all blighted or sun-scalded more or less when they commenced to bear. Of the apples, the Duchess stood best against blighting; and of the crabs, the Maiden Blush. When the blighting commenced I had the trees heavily mulched. I did not like the mulching, because it drew the roots up towards the surface of the ground, and even into the mulching. I remember an old farmer in Sweden used to say: "Plant a stone with the apple tree and then you will have a healthy tree." I have also observed several times in the nursery rows, a stone close to the tree. Those trees looked healthier and did not blight. As we know that the stone keeps the ground cool, I wonder if the low temperature prevents the sap from rising too early. I should like to know if anybody has tried this or had any experience in it. I will try it myself next spring.

THE RUSSIAN APPLE TREES.

In the year 1875 I got cions of thirty sorts of the Russian apple trees from Hon. William Saunders of the Department of Agriculture at Washington, being a part of the importation made under his supervision in 1870; put them upon apple roots, and set them out in the spring of 1876, so that they, or such as survived, are now eight years from the graft. Some of them were of the German name, and all these failed.

WINTER VARIETIES.

No. 378, Hibernial, neither blighted nor sun-scalded; bore last year lots of large fruit.

No. 472, Ostrekoff's Glas, just as hardy as the Hibernial; good bearer, but fruit a little smaller.

No. 410, Little Seedling, bore fruit this year; small apples, but heavy bearer.

No. 70, Winter Pear, and No. 580, Winter Lowland, have not fruited yet; blighted some last year, but this year not.

LATE FALL OR EARLY WINTER SORTS.

No. 240, Lieby, the tree is hardy; fruit large, and of fair quality; bore a good deal last year. This and the Ostrekoff Glas seem to be of the Duchess type, but the trees are hardier.

No. 170, the Revel; No. 310, Christmas; No. 335, Green Transparent; and No. 874, Sweet Mushroom, have not fruited yet, but seem to be hardy trees.

SUMMER APPLE.

No. 262, Charlamoff, is a larger and better eating apple than the Duchess, and the tree looks hardier. It bore lots of fruit last year.

My apple trees bore very little fruit this year, as the blossoms were spoiled last spring by frost.

If this is to be read in the meeting, I hope I will be excused, as I am not posted in the English language, so that I may not have given it its proper form.

The programs and premium lists received, and I will distribute them.

If I am well I will come to the meeting, January 15th, and bring the Russian apples with me.

A few days ago I was out in the western part of Carver county, and found there a number of Russian varieties on the farm of P. H. Terlinden, in the town of Young America, recently bought of Mr. Thomas, who planted the trees. The labels were all off except one or two trees, but Mr. Thomas gave me his original plat of the plantings. When I came home I made labels according to the plat, and went out again and labelled all the trees that I thought were of any value, and cut a few cions from the following :

- No. 264, Smelling Apple.
- No. 986, Green Annisette.
- No. 287, Riga Transparent Juicy.
- No. 558, Early Cinnamon.
- No. 268, Saccharine.
- No. 413, Cross Apple.
- No. 128, Sheepnose.
- No. 475, Holdfast.
- No. 177, Green Streaked.
- No. 178, Barloft's Apple.
- No. 275, Zolotoreff.
- No. 398. Enormous.

It was not the proper time to cut cions in the winter, but I thawed them out in moist ground, and think they will be saved.

Julius Ackerman, in that part of the county, I was informed, had a vineyard of very nice grapes.

Waconia, January 7th, 1884.

Mr. Pierce. I have seen the Russian apple trees on Mr. Peterson's place. They have been put to a very severe test, and the varieties named in his report as hardy are truly in perfect condition. They have had all the sun, wind, heat and cold possible—no protection whatever—and yet after eight years' growth are uninjured in any respect. Some of Mr. Peterson's Russian sorts have failed, as he says; but where they failed the Wealthies failed—not hardy enough. Mr. Peterson has got something in these staunch survivors that are hardier than Wealthy, hardier than Duchess even, and the quality is good. He has done a great work out there all by himself for the horticultural society, in his experiments and successes, and has been liberal with us in supplying cions for our experimental stations. Therefore, Mr. President, as a mark of our appreciation of this farmer's services to the public in fruit raising, I move that we make him an honorary life member.

Secretary Gibbs. I found Mr. Peterson and his Russian apple trees in my searches for fruit for the American Pomological Society. They were a great surprise to me. I recognized them at sight as an acquisition. It was in August. The fruit was not ripe, but it was even then very large and handsome. They were the first root grafted Russians I had seen—and the first winter keeping Russians I had heard of in the state. Hardly daring to trust my own judgment, I went there again in November, and asked Mr. F. G. Gould, a member of our executive committee, to go with me. We found the apples then matured, and by an exchange with Mr.

Peterson, obtained a supply of cions for our society, which have been distributed for propagation for our benefit. A list of the cions will be printed in the annual report. Pending the resolution I would like to hear from Mr. Gould.

Mr. Gould. Some of these trees are the hardiest I have seen in Minnesota. I have visited them again since I went there with Mr Gibbs in order to see if my first impressions would be confirmed. They are not all absolutely perfect, as Mr. Peterson states himself, but there are sorts among them that are, and I believe we have got something here that cares nothing for our cold winters or our hot summers. From the form of the apples I should judge them to be of the Aport class.*

The question being called on the motion to make Mr. Peterson an honorary life member,

Mr. Peterson arose and said:

Mr. President, I am old. It is not much more that I can do for horticulture.

Mr. President, I guess you better draw that back.

But the motion was put and adopted unanimously.

Mr. Peterson thanked the society for the honors paid him, but did not think he had done anything to deserve them. Many of his neighbors, like himself from the old country, would be benefited by the society's publications, and he would like to get them for distribution, and have his people unite with the society in its future work.

On motion, so much of the Secretary's annual report as related to accounts of moneys was referred to the Finance Committee, and the recommendations of the Secretary on other matters were referred to a special committee, consisting of R. J. Mendenhall, Truman M. Smith and Prof. Edward D. Porter.

A recess was then taken till 7 p. m.

*Note by the Secretary. From descriptions I gave Prof. Budd of tree and fruit, he recognizes them as a form of the Anls, a race having many variations, but all hardy in tree.

EVENING SESSION.

Second Day, January 16th.

The evening session was held in the room of the Delta Sigma Society, at the University of Minnesota.

The first paper read was the following:

OUTDOOR RECREATION AND EMPLOYMENT FOR WOMEN.

BY MRS. IDA E. TILSON, OF WEST SALEM, WIS.

The American people are fast livers. As children they are in a hurry. The popular school teacher is she who promotes most rapidly. Pupils cram with feverish eagerness for examinations, and talk less of a well-rounded education than of passing into higher classes. They enter society young, and grow prematurely old. The climate is peculiarly stimulating. Thousands of fertile acres west are given away for the asking. Excited emigrants thither load trains and fill hotels. Every day there comes the shock and pain of parting with friends. Omnipresent telegraphs and newspapers, every day stir up people about all the murders and accidents in two hemispheres. Advertising devices weary by their number and pertinacity. A late Sunday-School *Times* truly said, "Our fathers dwelt by a quiet pool, we have ever the roar of an ocean in our ears." Even fashion has its fierce competitions. It is a saying "as well be out of the world as out of fashion," certainly as well be out of the United States. Parisians, though they invent the fashions and coax away the dollars, themselves use far plainer furniture,

food, and clothing. American families of but moderate means, go through one round of twisting, turning, planning and economizing to keep up appearances. Is it strange that insane asylums are numerous, spacious and well filled, or that new varieties of nervous diseases are constantly being discovered? A recent English visitor, Herbert Spencer, the philosopher, gave his word of warning. Women, with their sensitive and delicate organizations, are perhaps greater sufferers than men, and especially need relief and recreation.

The usual agency employed to relieve overstrained nerves, is a multiplication of artificial amusements which but continues the fatal excitement. Where accessible, theatres and operas are crowded. Can glare of lights and gay costumes, constrained sitting, late hours and appeals to emotion, prepare one for repose? Does reading high-pressure novels, or whirling in the dance, or jolting in the cars, give tranquility? There may be intellectual or artistic merit in these entertainments, but not rest.

If recreation is to renew or refresh, it must supply what everyday occupations do not, natural, unstudied pleasures. The average woman is confined within doors much more than the average man, and her work is more monotonous. Her recreation, therefore, ought to be out of the house and away from dull routine. A physician, coming into Wisconsin at an early day was told there would be no business for him. "I will wait," he replied, "till folks finish off their houses, furnish and shut them up, then I'll have business." In well-ventilated rooms there is liable to be some carbonic acid from breaths, or drain and cellar germ-life, or dust of disintegrating walls and furniture, or too much shade. Pure, out door air has never had a reputation for making people sick. Sunshine itself is a highly recommended medicine. Communion with nature constantly brings one into contact with fresh influences. The earth is forever sweeping on to new positions in space. There are never two days, nor two sunsets, nor two trees precisely alike. Floods, drouth, blight, or grubs, upset all calculations, make every season, for some reason or other, very remarkable, and continually test "the memory of the oldest inhabitant."

Lawn mowers, garden rakes, and hoes, are not beyond the strength of a creature that can roll pie-crust and wash clothes. Gathering and planting seeds is light work. Women have just the promptness to insure success in early gardening. It does not require genius to graft and bud trees. Several women have practiced this art successfully, one of whom has lately written, on this subject, an interesting article for the *Youth's Companion*.

Horticulture furnishes forms of enjoyment not properly utilized by ladies. A well-arranged yard is as convenient as an orderly house. People who raise their own vegetables and fruits, can have them when they are firm but not unripe, and juicy but not decayed. They will eat their greens earlier and oftener than one dares who purchases at market prices. A fine flower-bed permits its owner to enjoy the luxury of giving. Its lovely blossoms will not only decorate home tables and mantels, but also ornament the house of God, cheer the sick-room, and soften death's hard outlines. Not all can afford costly gifts, nor does every one care to be under obligations for such. Flowers and fruits make delicate and inexpensive presents, which any one may give or freely accept. A walk or ride is soon over, pies and cakes disappear with alarming rapidity, dishes have to be rewashed three times a day; but flower-beds are bright for weeks, and tasteful grounds grow in beauty with years.

Those excellent outdoor exercises, riding, walking, and croquet, already accepted and appreciated, whose claims, therefore, it is not so necessary to urge, they are very delightful when horticulture has preceded them. Pleasant streets and roads are always resorts. Visitors and friends are taken to see them. And, in proportion as such places grow more handsome, are they more frequented. Croquet and kindred games are hardly practicable without a smooth lawn. Convenient seats often allure one into a game. The possessor of a garden-plot frequently inspects its flowers and fruits, and whoever has a vine and a fig tree of her own, naturally rests in their shade. Thus horticulture not only brings its rewards, but brings people out to see what those rewards are.

If possible, every person ought daily to learn something new and valuable, though not necessarily from books. "It is not all of life to live." Unfortunately, many a woman's education is finished in her teens, just when she is beginning properly to study and think. Horticulture summons many sciences to its aid, and combines with recreation fine intellectual opportunities. The habits of plants are learned, the nature of soils, the effects of moisture and heat, and the depredations of insects. Without knowing it, one becomes a botanist, a geologist, a meteorologist, and an entomologist. Chemistry teaches how to compound and where to apply fertilizers and explains why some of them are potent at once, and others only in time. Isaac Newton watched a falling apple, and discovered that great law of gravitation which governs myriads of worlds. The wonderful machines for farm and garden use, inventions mainly

of practical workmen, are often but extended applications of principles in natural philosophy. To discover laws of nature and habits of plants and insects, there must be close and long-continued observation. By time the facts are gathered there will have been much excellent mental exercise and discipline besides. So great is the variety of grasses, plants, trees, flowers, and fruits, that there is as much scope for judgment and taste in arranging yards and gardens, as in designing and painting pictures. Landscape gardening indeed rises to the dignity of a fine art. To be sure, one may ignorantly plant and successfully gather, yet such is not likely to be the case.

Women are expected to be the teachers of refinement. They ought, therefore, to fit themselves for this work in God's great Normal school of beauty. A story is told about a plant, which was given to a poor family, who could not see it through their dirty window, and in consequence, washed the glass. Then the room, by contrast, seemed very grimy, and was cleaned throughout. The flower looked so well, they added other adornments to their home. Neighbors caught their enthusiasm, and, ultimately, the aspect of a whole block was changed by the ministry of a flower. "Picciola" may be familiar, that French classic, with the further merit of being true, which relates how Count de Charney, gay, accomplished, and skeptical, being cast into prison, was cured of his moral and physical disorders by a little plant, which thus achieved what neither books nor men had been able to do. The prisoner wrote on his cell wall "Chance is the sole author of the creation." A flying dove dropped a solitary seed into his prison yard. The seed was trodden under foot, but a fleshy envelope, affording protection to its first, tender leaves, helped the plumule through the hard crust above it. A frosty night came. The thick bristles upon its stalk were covered with rime, but the plant itself was uninjured. Hail fell, and its leaves closed about the stem, presenting a series of points only. Though nourished by the same soil, peduncle, leaves, and blossom, each, in some way, appropriated its own hue. When high winds blew, the flower prudently bowed. Charney added "perhaps" to what he had written before on chance. Ill, a decoction of the leaves cured him. Erasing all that was on his cell wall, he then wrote "I believe in Providence." In one severe storm he stationed himself near his favorite, and, bending over, devoted himself, like a lover, to its protection. The coarse, rough jailor became interested. He even watered the plant, and sanctioned removing one of the flag-stones which hindered its growth. Visitors

heard the story. The Empress Josephine was petitioned for Charney's release. Now Josephine was an enthusiastic admirer of flowers. It is said she loved the crimson of her lilies better than the hue of her royal robes, and the fragrance of her magnolias, far more than the breath of courtly flattery. She, therefore, became Charney's willing advocate, and he was soon liberated, it is needless to say, a changed man. A faded blossom, in a valuable locket, long told the story to his descendants. Insect life, equally with plant life, shows adaptation and design. Can any one say that natural outdoor beauty is without moral influence?

The education of children is too often conducted by prosy and dull methods. The deservedly popular object lessons are hardly frequent enough. How can a mother so effectually tell her little ones to be joyous, like the birds, industrious as the bees, and modest like the violets, as when these living objects are present? A very young child may be taught to pity thirsty plants, and to carry them cold water. What better place than a garden for telling about Gethsemane's scenes, or about that heavenly home, "the leaves of whose trees are for the healing of the nations!" An acquaintance, a refined woman, who went west at an early day, and amid great privations, said, in answer to wondering inquiries. "In summer my children had always one place fit to receive their visitors—the garden." Will not such a painstaking mother keep her loved ones at home and away from temptation?

In practical America, the economic aspects of a question always command attention. There is never a lack of women and girls ready, for money, to enjoy sunshine, and to improve health, by tying and picking hops, or picking sage and berries. An acquaintance, a farmer's wife, left a widow with a large family, carried on her farm, kept her children together, and reared them all to fill respectable stations. The Youth's Companion lately told of two sisters with feeble, aged parents and no resource other than a small, poor farm. They seeded considerable of the land for pasture, bought cows and fowls, set out an orchard, learned to do many new things, hired their hardest work done, and gained, beside the respect of all who knew them, a fair competence. Have there not been many similar cases.

Not every one has a taste for farming, nor the strength. Perhaps no inexperienced person ought to try such work. But, if a woman is already living on a farm, and necessity arises, instead of selling at panic prices, she better, at least, try the experiment of remaining there and managing the business. Poultry is especially

profitable near barns and on farms, where there is always more or less grain wasted in feeding stock and in threshing. A large grassy run furnishes the cheapest and healthiest food, lasts a whole season through, and requires no daily preparation. One woman, who is a poultry-fancier, advertises in that prominent agricultural paper, the *Western Rural*. Bees are not liable to be taken up for trespass. The apiarist need not own land, but must have her location reasonably near meadow and woodland sweets. A few years since, one of the best and largest apiaries in the country was owned and managed by an Iowa woman. There are many live journals devoted to bees and poultry. Whoever is inexperienced, ought to take and read one of them. Intelligence and skill command as high a premium outdoors as indoors. Silk culture is now attracting much attention among Southern women. This is mainly conducted within the house, but, if the person engaged in it, plants and cultivates her own mulberry trees, and gathers the leaves herself, a pleasant combination of indoor and open-air work can be made. Italian women do so. A friend in California has gathered grapes and successfully cured them as raisins. More than one orange plantation of Florida owes its thriftiness to woman's care. The cultivation of orange trees, about which plows are little used, and hoes, rakes and brushes are chief implements, is just the work for her patience. A few years ago one woman in that state was employed by northern parties to superintend five different groves. The United States is the greatest strawberry-eating nation of the world. Who ever heard of strawberries being unsalable or thrown away? A small plot, well tended, yields large returns; so their production is practicable in villages and towns. Women and girls already do the picking. Is the planting and weeding any harder? With an occasional lift from masculine arms, and some weeding by little hands, vegetables can be grown. Mrs. Hoyt once said she had known a quarter of an acre, after the women of the household had taken it in hand, to yield vegetables enough for a large family, in no small variety either, besides a fair amount of small fruits. If it had before been customary to purchase these supplies, think of the saving. If, however, the fare had included no such dishes, the crisp lettuce, juicy radishes, delicate asparagus, and tart berries of that new administration must have lessened meat and flour bills. People do somehow satisfy hunger, if not with vegetables, then probably with pastry. In large cities there is some market for fresh flowers and tasty bouquets, other than greenhouse products. At Christ-

mas, Easter and various holidays, there is great demand for ever-greens, mosses, berries, lichens, and all woodland treasures which make beautiful and lasting decorations. It has often paid persons living at quite a distance, to gather these and to send them into cities. A few women in the tropical south, far west, abroad, or in any favorable locality for seeing new and rare things, get employment as collectors of specimens for botanical and other societies. Ladies who thoroughly qualify themselves by an actual and extended field practice in analyzing, are quite certain to have opportunities for teaching botany, a work generally reserved for them and always considered peculiarly appropriate. None of the pursuits above suggested will be apt to give an entire support, except general farming or poultry raising, but any of them will nicely supplement small incomes, and, at the same time be pleasing and healthful. Many of them are not inconsistent with other employments.

Some outdoor work does not yield immediate pecuniary returns, but is ultimately of importance. People, by living solely for the present, can be "penny wise and pound foolish." That they may have a few more acres in wheat, farmers often cut down choice timber, regardless of its worth as a wind-brake and as a retainer of moisture, moderating the air for rods around, and also of its great future value in wood and lumber, prices of which are constantly advancing. Wasteful methods of conducting the lumbering business are decreasing American forests with frightful rapidity. Ladies can interest themselves in the preservation and care of natural woodlands. They can join in forestry associations. By planting land to valuable timber, like locust and black walnut, a hundred per cent. has been realized in after years. The consumption of the walnut is more rapid than its natural increase. For many uses, neither other woods nor iron can equal it. Western tree-claims are becoming quite fashionable possessions for women, many of whom are themselves assisting in or superintending the planting and cultivation. The money expended for producing natural beauties on a place is always got back in selling, generally with high interest, but very rarely that invested in buildings, never so good as when new. Follow Nature, who hangs ivy 'round ruins and covers fallen trees with moss. The fashion of handsome grounds will prove as taking as any other. Whoever surrounds herself with beauty will lead her neighbors to do likewise, and, in a short time, there will be not only one fine place but a fine street, a fine section of country, perhaps finally a "banner" county. The wealthy

and refined will be inclined to remove thither. Their means and society will promote the business and welfare of all. Many a commonplace village has been dressed in loveliness by a rural improvement association. A writer for the Independent has instanced Mishawaka, Indiana, near South Bend, and Winnetka, a suburb of Chicago, where ladies have been enlisted in this work as theirs by nature and by right.

Outdoor employment as a means to these various ends, health, pleasure, culture, and gain, is comparatively inexpensive. Doctors' fees and medicines make larger requisitions of purse and courage than do rakes and water-pots. The possessor of shade trees and a tasty yard, has, for years perhaps, the pleasing use of the same things. It is not so with fine equipage and clothes, very soon worn out or unfashionable. Theatres, operas, and journeys are costly recreations. Garden work hardly admits of elaborate toilets, much less demands them. Nature's pages, ever open, can well be supplemented with books, but are in themselves a vast, universal library. No book-cases have to be provided, nor worn bindings repaired. A dollar's worth of seeds will sow a whole vegetable garden. The capital required for beginning a poultry or bee business, is ridiculously small. Twenty-five dollars spent for trees and shrubs, may, in a few years, add hundreds of dollars to the value of property.

Nor is there any neglect of housework proposed. "These ought ye to have done, and not to leave the other undone." It is believed proper outdoor recreation will give such increased health and vigor, that the same amount of indoor work can then be done in less time. The experiment is worth trying. Change does much to quicken preceptions and faculties. A man may find it profitable in more ways than one, to provide extra help in the kitchen.

If fashion and fame have weight with women, they ought to be reminded that Queen Victoria often attends the meetings of the Royal Horticultural Society. Mrs. Stowe's successful and famous orange grove has done much to interest people in Florida. She took a very active part in arranging and furnishing exhibits for the Horticultural Fair, at Jacksonville, in 1877. Bayard Taylor's mother last year won the first prize offered by the Woman's Association for the promotion of silk culture. Miss Youmans is author of a standard botanical treatise. Mrs. Treat writes for the first magazine of the land, on those special and rare phases of plant and insect life with which she is so familiar. Miss Murtfeldt is one assistant of the national commissioner of agriculture, in his entomologic

al department. Mrs. Comstock prepared several drawings for his last report. This list might be continued almost indefinitely.

Nature may be called the great mother. By her grains and fruits, all live. In her genial presence, any one may gain new hope and strength. On her bosom each will finally sleep.

“ But O, thou gentle Summer !
If I greet thy flowers once more,
Bring me again the bouyaney
Wherewith my soul should soar !
Give me to hail thy sunshine
With song and spirit free;
Or, in a purer air than this,
May that next meeting be.”

A vote of thanks and an honorary life membership was tendered to Mrs. Tilson, and she was cordially welcomed to membership by the president, who followed in some remarks about the work of women in horticulture, particularly in the raising of small fruits.

The next paper read was

THE GARDEN IN LITERATURE.

BY OLIVER GIBBS, JR., OF LAKE CITY, MINN.

Garden—An enclosed place for the cultivation of trees, plants and flowers.

It speaks well for the rank of Horticulture as one of the employments of man that in the records of all civilized and semi-civilized races, his greatest happiness in this world, and, in some of their theologies, in the next, is depicted in connection, one way or another, with the garden.

In the story of the creation the writer, wishing to represent the first pair in the most favorable situation for happiness, places them in a garden. This shows that in that far-off, misty part, when this story was written, the garden was then as now one of the brightest realities of life, as well as the poet's dream. And when misfortune marks them for its own, in what shape does it come? Consider it for a moment as it if were really a poem, a work of a romancer's imagination, seeking to show the contrasts of joy and sorrow in human life, while accounting for the origin of a race of

perfect beings and the introduction of sin and misery in the lives of men. What shall their punishment be? A limit to their lives? Dissolution of the body some nine or ten hundred years afterward? Physical toil,—the mere cultivation of the soil and the tending of flocks,—a pleasure to well-organized men? For Mother Eve, the duties of the home and the care of her family? This does not satisfy the poet's conception of trouble. Some crushing woe must be made to fall, and they are banished from their garden.

“Banished ! Oh, Friar, the damned in hell do use that word,
Howlings attend it.”

A redeeming thought in relation to this woeful banishment is that we are not told that they had either made the garden by their own toil or bought it with a price, or had a warranty deed or any bond for a deed, or were foreclosed out of it on a mortgage. But though they were tenants at will, we can agree with the writer that no greater punishment could have been devised and made probable to suit the circumstances of the case than to drive them out of the garden, without any equipments to make another. We are not even told that they were allowed to carry away their garden implements or seeds for a new crop, or cions from any of the trees, unless possibly Mother Eve had some from the apple tree concealed about her person.

Much of the poetry of the Hebrew nation is concentrated in the Song of Solomon. I shall take the liberty of erasing the head lines of the scribes and consider it for what it appears to be,—a song of love. And now look through it and see how at every turn of the poet's thought, some picture of the garden flashes into view:

“As the apple tree among the trees of the wood, so is my beloved
among the sons.”

“I sat down under his shadow with great delight, and his fruit
was sweet to my taste.”

“Stay me with flagons, comfort me with apples ; for I am *sick* of love.”

“Lo, the winter is past, the rain is over and gone, the flowers appear on
the earth, the time of the singing of birds is come, and the voice of
the turtle is heard in the land.”

I will take the further liberty of adding a line to this song, and say of this turtle, which is supposed to be our gentle friend, the turtle dove—

“Behold, where she alighteth in the strawberry patch, there is the first
ripe berry;”

And still another line,

“Also, she is welcome to it.”

“The fig-tree putteth forth her green leaves, and the vines with the
tender grape give a good smell.”

Are the lovers in the song separated, they seek each other in the garden.

“I went into the garden of nuts to see the fruits of the valley, and to see whether the vines flourished and the pomegranates budded.”

Do they meet elsewhere, they repair to the garden.

“Let us get up early to the vineyard ; let us see if the vine flourish, and the pomegranates bud forth.”

The mandrake gives a smell, and at our gates are all manner of pleasant fruits.”

Twice they say in this song they are sick of love ; but they never seem to tire of their garden.

Take any history of oriental nations, where do you find the people in their happy moods ? Persian or Turk, Hindoo or Chinese, it is in their gardens.

At the mention of the city of Babylon, what picture is conjured up most brightly in our minds as we dwell on our readings of her ancient splendor ? We behold in the distance the artificial mountain on the plain of the Euphrates, its high rocky precipices overhung with verdant vines and their summits crowned with lofty trees ; and as we come nearer we see that here are the Hanging Gardens of Nebuchadnezzar, whose columned terraces were called by cotemporaneous nations, one of the wonders of the world. The Indian princes built some of the most magnificent temples on earth, which are still the wonders of architecture, to the memory of their dead wives—an example of taste we are not qualified to fully applaud or quite condemn ; but our ancient brother who built these hanging gardens, and who was no doubt President of the Horticultural Society of Babylon, set us a better example, as they were a memorial, not to the dead, but of his devotion to a wife while living and within the reach of his care and sympathy.

History has left us but little that we can know of Babylon, but the Hanging Gardens must have been the scene of many a happy festival—perhaps a Mecca for horticulturists of all nations to visit—certainly the resort and pride of the Chaldeans ; and when we read that Nebuchadnezzar ate grass and companioned with oxen we almost fancy he is under the slander of some envious heathen who has heard of, but cannot understand the sweet herbs of this garden, or the *celery* that even then might have been brought up from the sea-coast and domesticated for man's use.

Coming this way a few centuries, look at Mark Antony and the Roman citizens at the burial of Julius Cæsar. Brutus has addressed the multitude, and convinced them that Cæsar was ambitious, and

the preservation of Roman liberty required that he should be slain. His assassination was, therefore, an act of patriotism, and Brutus was now their hero for having done it. Antony ascends into the rostrum. They frown upon Antony. They will listen patronizingly to a temperate eulogy of Cæsar; custom and decency demand this; but

“’Twere best he speak no harm of Brutus here!”

Antony commences his oration. He tells them of Cæsar’s services to the Roman state; his benevolence to the poor; his refusal of the crown when offered, thrice, at the Lupercal; their own former love for Cæsar; and now behold the spring in their hearts that he touches at last to fire them to rage and mutiny against Brutus and his fellow conspirators. He tells them of the provisions of Cæsar’s will.

“Moreover he hath left you all his walks,
His private arbors, and *new-planted orchards*
On this side Tiber; he hath left them you,
And to your heirs forever; common pleasures,
To walk abroad and recreate yourselves.”

What! the imperial parks, arbors and orchards left to the common people of Rome—the toiling masses—for their enjoyment, they and their heirs forever. Is it any wonder that all blame for Cæsar’s ambition, all complaisance towards Brutus defending the assassination, vanishes from their thoughts, and that when Antony after a pause in his oration, exclaims:

“Here was a Cæsar! When comes such another?”

They answer in their new sense of bereavement, ‘Never! never!’ and kindling into fury at the thought of the conspirators who have stricken down this great friend, they shout:

“Away! away!

We’ll burn his body in the market place
And with the brands *fire the traitors houses!*”

I am afraid there were no horticultural societies in those days in Rome, else parks and orchards for the common people could not have been so precious and so rare. In fact it is almost certain there were not, for Pliny tells us they had only twenty-two varieties of the apple in his day, and it was then among their people such a sour and astringent fruit that the Romans bestowed on it “many a shrewed and bitter curse;” and hence we have its generic and inappropriate name to-day, *Pyrus Malus*, the fruit that is *bad*. If we ever have a World’s Pomological Convention, the committee on nomenclature should change this, and gild the apple with a new name in Latin, culled from the choicest terms they have.

I have often studied the tragedy of Richard the Third and its antecedent the Third part of King Henry the Sixth in Shakspeare, to come if possible into the mind of the great dramatist, and find out the secret of Gloster's power over his associates of the court, over whose downfall he was ever scheming to make his bloody and usurping way to the English throne, and yet holding them in action subject to his will, until, one after another, it came their turn to die. Consider him in the scene at the Tower, where the council has been called to take action about the coronation, but which is to culminate in the sudden denunciation, arrest and execution of the unsuspecting and light-hearted Hastings, whom now, at the opening of the council, and before, "My Lord Protector" has, in his own mind, already turned "down the road to dusty death," along with the young prince whom they all but Gloster and his two confederates are soon expecting to bow before as the new-crowned successor of the new-buried king.

Enter Gloster to his ghastly business. He arrives late. All has been done except to name the day, and this were done had he tarried a moment longer, for Hastings has spoken for him—Hastings is sure of Gloster's love, and he may take that liberty. Gloster's secret thought is to break up the council at all hazards and throw the blame on Hastings, who shrinks from following him further in his career of treachery and ambition. How does he disarm suspicion and screen his own sinister thoughts from penetration of his victims? Was ever such diabolical dissimulation really seen on earth? It seems almost incredible:

"My noble lords and cousins, all, good morrow ;
I have been a long sleeper; but, I trust,
My absence doth neglect no great design,
Which by my presence, might have been concluded."

Buckingham replies:

"Had you not come upon your cue, my lord,
William Lord Hastings had pronounced your part—
I mean your voice for crowning of the King."

And Gloster still acquiescent :

"Than my lord Hastings no man might be bolder.
His lordship knows me well, and loves me well."

Is this irony, or is it sincere? This must be high courtesy. We have mistaken this man. We are all safe with him. This is no dark and cruel Gloster. Look you! Hear him speak again:

"My lord of Ely, when I was last in Holborn,
I saw good strawberries in your garden there,
I do beseech you send for some of them."

The Englishman loves beef, and my lord Bishop of Ely doubtless had "land and beeves" and "kept a farm and carters," and possibly he owned a trout stream or a salmon river on his estate. Why did not Gloster make some pleasant allusion to the savory round at the country dinner at Holbern, or recall some sport in angling? It would have been quite as easy. Ah, but he was among the epicures of the court that day. The times were grave. The highest stroke alone could kindle their imagination and shift their attention from him a moment while he collected himself for his coming tiger-spring out of the jungle of his difficulties:

"I saw good strawberries in your garden there;
I do beseech you send for some of them."

This was the master touch of magic. The court, the crown, the recent death of King Edward, the coronation of the prince, were all forgotten. The scene before them had faded, and their minds were fixed upon that rural, peaceful, happy scene where grew "good strawberries;" and they were "his pipe to play what stop he pleased." Even the wily Buckingham is the first to stalk towards the trap that sets for all who are or may be in Gloster's way, and which is to spring upon him soon, though he run from it, as one of the victims next in the order of death. Who could not be diverted from the grave affairs of state by the introduction of such a theme? Who would suspect the motive of Gloster behind the devilish ingenuity of such a suggestion at such a time for such a purpose?

"Come into the garden, Maud."

English poetry, from Chaucer and Spenser to Tennyson, blooms in the garden. Shakespeare is full of it, and we turn to him once more. The orchard, the tree garden, the flower garden, is the scene of choicest hospitality, of the finest love passages, the drollest fun, and, in one case, of the darkest tragedy—a brother's murder.

"Now," says Justice Shallow, in *Henry the Fourth*, proud of his own handiwork among the apple trees, "Now you shall see mine orchard, where in an arbor we will eat a last year's pippin of my own grafting with a disk of caraways and so forth." And in the "*Merry Wives of Windsor*," Sir Hugh Evans, the Welsh parson, hastens to reach the last course of the dinner, "for there's pippins and cheese to come."

Where in the drama is there a finer scene than the festival of the sheep shearers in the "*Winter's Tale*," when Perdita, "the

prettiest low-born lass that ever ran on the green-sward," comes among the guests with gifts of flowers and chatters of "rose-mary and rue, grace and remembrance," the flowers of Winter? One might fancy that Thomas Andrew Knight, President of the old London Horticultural Society, had lived two hundred years before his time, and stood at Shakspeare's shoulder when this scene was penned to teach a lesson in cross-breeding of flowers, and in grafting tender cions on hardy stocks, and put it into the dialogue between Perdita and Polixines. She will have none of the carnations and streaked gilliflowers, will this pure maid; they are not true to the conventionalities. She has heard

"There is an art which in their piedness shares
With great-creating nature;"

forgetting in her own fidelity and innocence what the wisdom of Polixines reminds her of, that

* * Nature is made better by no mean;
But nature makes that mean, so o'er that art
Which you say adds to nature, is an art
That nature makes. You see, sweet maid, we marry
A gentle cion to the wildest stock,
And make conceive by bark of baser kind,
A bud of nobler race. This is an art
Which does mend Nature. Change it rather; but
The art itself is nature."

Now, she tells them of

"Daffodills,
That come before the swallow dares and take
The winds of March with beauty; violets dim,
But sweeter than the lids of Juno's eyes,
Or Cytherea's breath; pale primroses
That die unmarried ere they can behold
Bright Phoebus in his strength,

* * * Bold oxlips
And the crown imperial; lilies of all kinds,
The flower-de-luce being one."

Under the inspiration of these treasures of the garden, linked to love and hospitality and the admiring eyes of Florizel, she wonders at her own mental exaltation, and thinks the unaccustomed dress they have put upon her as mistress of the feast has become a robe of magic:

"Sure this robe of mine does change my disposition."

And Florizel, influenced by the same enchantment, ascribes the charm to her :

* * * "What you do,
Still betters what is done. When you speak, sweet,
I'd have you do it ever. When you sing,
I'd have you buy and sell so; so give alms;
So pray ; and for the ordering your affairs,
To sing them too."

And where, in all literature, is there a finer compliment to womanly grace than this, or one-voiced in honest admiration ?

"When you do dance,
I wish you a wave of the sea that you might ever do
Nothing but that!"

There is such a charm to me in Shakspeare's gardens that I hate to leave them; but with one or two more references, I will pass them by.

The crime that drapes the pall of tragedy over all the scenes of Hamlet has a darker hue from having been done by taking advantage of the slumbers of the King of Denmark in his orchard, as witness the revelations of the mailed ghost:

"'Tis given out that, sleeping in mine orchard,
A serpent stung me ; so the whole ear of Denmark
Is by a forged process of my death
Rashly abused. But know, thou noble youth,
The serpent that did sting thy father's life
Now wears his crown !"

And poor Ophelia, in the same tragedy, heart-broken and crazed by the distraction of her royal lover, and the cruel fate that makes him by a sword-thrust intended for the fratricide king the slayer of Polonius, her father ; how many tears have blotted the page where she prattles in her madness, of her flowers, and running over the list in her wrapt, wild fancy, sighs at last—

"I would give you some pansies, but they
All withered when my father died!"

I must beg to be excused from quite so much as the popular admiration for another garden scene in Shakspeare, where, though

"Orchard walls are steep and hard to climb,"
young Romeo reaches the garden of the Capulets, and looking up into Juliet's eyes, declares that—

"Two of the fairest stars in all the heavens
Having some business, do entreat her eyes
To twinkle in their spheres, till their return."

This and the dialogue that follows is rather stilted ; the passion too tropical for Shakspeare's work, and suggests the idea of inter-

polation or patchwork—part Shakspeare and part Italian ; but as the play proceeds we have Mercutio, Friar Lawrence and the ragged apothecary, Juliet's grief and Romeo's despair at the separation, their fidelity to each other in life and death, and gem after gem immortal in quotation, which bear the genuine stamp of the great master's mind.

To change the scene, here are Sir Toby Belch and Sir Andrew Aguecheek waiting in Olivia's garden, in *Twelfth Night*, to punish the supercilious Malvolio with Maria's device about the forged letter. There is nothing particularly horticultural about this, only in the location of a very practical joke, which all but the victim in yellow stockings and cross garters can enjoy ; but it reveals the garden as a good place for social fun ; and when Malvolio who has been captured by the snare laid for him, loftily reads in the letter :

"Some men are born great, some achieve greatness, and some have greatness thrust upon them,"

We realize that the greatness that is thrust upon him is no boon, and we can moralize that if we are born great it is our inheritance, if we achieve it, it is our just due, but if thrust upon us, we had better refuse it as an ill-fitting garment of little comfort and no honor.

In poor old Scotland the garden does not seem to flourish as well in literature. There is more of clanging swords and waving banners, the pibroch scream, and the defiance of clans echoing from glen to cliff. Yet even here the rose in her highland home is Queen of Scots, and she is the mother of our best and hardiest garden pets of the rose family. Here too the yellow rose was once the highest badge of honor that could be conferred by king or queen. I think there must be Scotch blood in my veins, for nothing else in the rose garden pleases me so well, nothing else is so stately in its form of growth, or contrasts so well with surrounding color as the Scotch yellow rose, parent of its close copy the Yellow Harrison, and, too, nothing else is so hardy. Then the wild stock of the garden is all hilarious in Scottish poetry—the birds, the trees and the flowers ; and who can think of them without recalling

"The fragrant birch and hawthorn hoar"
that sheltered "Highland Mary." Take out

* * * "the mavis singing

His love song to the morn ;"
the "bonnie lark"

"When upward springing, blithe, to greet
The purpling East ;"

or the birds of "Sweet Afton,"

"Where wild in the woodlands the primroses blow,"

and these four lines from one of Burns' songs:

"The lavrock shuns the palace gay,
And o'er the cottage sings;
For nature smiles as sweet, I ween,
To shepherds as to kings;"

or this also from Burns—now mark it:

"*The feathered people* you might see,
Perched all around on every tree,
In notes of sweetest melody,
They hail the charming Chloe!"—

This is poetry; there is not a finer verse in the human language. We sometimes hear one speak of getting *down* to the level of the beast. One who gets up to Burns's level when that inspiration flashed upon his mind—"the feathered people"—has got to *climb*!

"Perched all around on every tree!"

Behold the blackbirds, the robins, the brown thrushes—our American mavis, for even the thrushes are social if you court them well—all the social birds of spring or summer—what else are they up there in the trees for but to greet the little maiden in white frock and bright ribbons, and gaily trinked with flowers as she dances about the meadow or the lawn?—

or forget when

"On the briar the budding rose
Still richer breathes and fairer blows;"

or

"The woodbine in the dewy weat
Where evening shades and silence meet,"

or the

"Wee, modest, crimson-tipped flower,"

that in the "Lines to a Mountain Daisy" inspired our bard of nature with a poem whose every line is a gem as clear as—

"The dew-drop clinging
To the rose just newly born;"—

and how much less there would be to make the appreciative gardener's thumb-marks on the well-worn leaves of Scottish poetry.

Time will not permit us now to wander longer in the gardens of literature abroad; nor even to stop and trace the influence of the garden upon American life—we can only glance at it. In literature, our poets who have attained the highest rank and the greatest fame, are the most reverent students of nature and the best

lovers of the garden. Longfellow and Bryant,—how much and how aptly we could quote from them!—and he whose quaint fancies pictured Hulda and

“The apples she was peelin’”

and to whose mind as he thought of this nice country girl,

“The dogwood blushin’ by the brook

Weren’t modester nor sweeter,”

has recently had bestowed upon him the highest literary honors yet conferred on any American citizen in a foreign country.

Were you to seek our greatest American historian in the summer season, you would find him in one of his rose gardens at Newport or Washington. A new fact in history would be hardly more interesting to him than a new beauty or an improved fragrance in a rose.

Finally, what is the sweetest dream of the man of affairs as he looks forward to the close of his struggle for fame or wealth and prepares for the quiet and peace of declining years? Is it not to retire, and amidst rural employments wherein the garden and the companionship of books and chosen friends shall occupy his time, repay himself for the mental starvation of years of enforced and ill-assorted toil. Happy for such a man if he join the Horticultural Society and learn how to take care of his garden while there is yet time. To such a man, equipped by the study of nature—and here I quote again from our old friend Solomon—

“To know how the world was made and the operation of the elements;
The beginning, ending and midst of the times;
The alterations of the turnings of men, and the change of seasons;
The circuits of years and the positions of stars;
The nature of living creatures, and the furies of wild beasts;
The violence of winds, and the reasonings of men;
The diversities of plants, and the virtues of roots;
And all such things as are either secret or manifest;
Loving the thing that is good;”

Becoming by the influence of these employments and these studies,

“Kind to man, steadfast, sure, free from care,”

Life must proceed to its close as calmly as the current of the gently flowing river; and the final transition to that undiscovered garden where fruits and flowers immortal grow, be but the passing into the peaceful slumber of one who

“Wraps the drapery of his couch around him
And lies down to pleasant dreams.”

The grandest thing for our contemplation on this earth is that old age that having this wisdom enjoys in retirement the sure reward of a clean unselfish life in harmony with nature, and which approaches the restful dissolution of the body with no anxiety lest some opportunity may pass overlooked of doing good.

American Horticulturists will not look far nor think long to find, perhaps more than one figure like this, declining on their horizon.

A vote of thanks was tendered for the "Garden in Literature," after which the society took up the discussion of small fruits, for the remainder of the evening, and in response to a call from R. Porter, Mr. Golden, of Plainview, gave his experience with blackberries. He tried for sixteen years to raise the Lawton, and had a time of it, and got one berry. He then tried the Taylor, and got one crop in five years; a full crop, that was last year. They are now frozen down to the snow line. He thinks they are dead, but his wife has hopes.

President Harris. I am having good success with the Snyder and Stone's Hardy. The latter is more easy to protect, the bushes are not so stiff and upright in growth as the Snyder. O. M. Lord, of Minnesota City has quite a plantation of Stone's Hardy, and protects them by taking a spadeful of earth from one side of the roots, then bending down the canes and covering with earth. They bear well and pay well. Ancient Briton is a large berry, but not so prolific as some of the others. I think some improvement might be made by selection and cross breeding with the wild blackberries.

Truman M. Smith. Several gentlemen of St. Paul are cultivating the native trailing blackberry.

CURRENTS.

Secretary Gibbs. We have heard for many years, principally by way of nurserymen's catalogues, of varieties of currants that are larger than our common Red and White Dutch, and said to be productive and good; but I have watched the markets for them in vain, till last summer I saw for the first time the proofs of their existence. This was at St. Paul. In the city markets there I saw abundant supplies of very large and handsome red currants on sale, day after day, and I would like to know what they were, who raised them, and all about them.

Truman M. Smith. The large currants in the St. Paul market which Secretary Gibbs refers to were the Prince Albert. I have grown them at my place on Dayton Bluff, and have received more profit from this variety than from all other kinds together. The only objection is to its color. It is rather pale, but being a large currant, very prolific *and ripening late*, it always sells for a good price. Stewart's Seedling is promising well, and I think much of it so far. Ripening before the Prince Albert, the two varieties go well together to prolong the market.

C. L. Smith. Do you know anything of Fay's Prolific currant.

Truman M. Smith. Too high priced. In reply to a question: White currants are not in much demand in the market, they are only wanted for table use. Another question: Do you have the currant worm? Answer. Ordinarily, yes; but it will not do much damage if you keep the ground clean. Recurring to the Prince Albert currant: It ripens just in time to come in right after strawberries.

The Secretary. Have you the plants to sell?

Mr. Smith. That is out of my line, as I am a fruit grower, not a nurseryman, but I might spare a few.

Mr. Smith spoke as follows of other fruits, in reply to questions as to his knowledge and experience:

Cuthbert raspberries have sold at twenty-five and thirty cents per quart in St. Paul, when Philadelphias would only bring twelve and one-half to fifteen cents. Turner's sell better than Philadelphias.

I consider the Delaware the best grape out of forty or fifty varieties I have tested. Concord comes next, for profit, and, in small quantities for home use, the Northern Muscadine is good. It is excellent for jelly, before fully ripe, but when ripe, will drop from the stem.

MORNING SESSION.

Third Day, Thursday, January 17th.

The session opened with music by the University Glee Club.
The following paper was then read by W. S. Mesmer:

THE WAUPACA COUNTY SEEDLING APPLES.

BY WILLIAM A. SPRINGER, OF FREMONT, WISCONSIN.

I have been asked to give an account of the seedling apples produced in Waupaca county, Wisconsin, which have been noticed more or less in western horticultural reports of the last few years.

The Wolf River takes the lead. It is the oldest of the lot, and has had the most general trial. The old original tree, from seed I planted thirty-two years ago, is still perfectly healthy, although it stands in the most trying place, where its roots touch the waters of the Wolf River. It has not missed a crop since 1862. The young trees are all doing well so far as I know. I have no trees that gave me so many apples this year as my twelve-year-old Wolf Rivers.

THE WRIGHTMAN ORCHARD.

This seedling orchard is at Weyauwega. The trees are all healthy and nearly all are good bearers. Ten of the varieties were exhibited this winter at the Wisconsin meeting. One of them, called the

Weyauwega, has borne from a fair to a heavy crop of fruit every year for the past fifteen years. The apple is a good keeper. The Wrightman's Blush is an excellent keeper and a good bearer. The Flora the same. The Martha is a fair bearer but a slow grower. The Waupaca, although a large, beautiful apple, and a great grower, is not a great bearer. The other varieties not named are all excellent trees and good bearers.

THE BENNETT ORCHARD.

This is at Royalton. Many of the varieties are very choice. Ten of these, also, are exhibited this winter. Every tree is perfect and all good bearers. Mr. Bennett has one of the best orchards in the county. It stands on a south-easterly slope. His seedlings are mostly numbered. So I will say nothing now of any except the Bennett, which is a beauty, of excellent flavor, an abundant bearer and one of the best market apples he has.

THE WHINNEY ORCHARD.

M. A. Whinney, at Lind, has about ten varieties of seedlings. All the trees are healthy and are fine bearers. The Helen is a keeper, and a free bearer. His orchard is on high ground, but level.

THE GIBSON ORCHARD.

This is also at Lind. Mr. Gibson has many very nice apples and good trees. His Sprawler, as friend Plumb called it, is a keeper, a good apple and a perfect tree.

THE STREET ORCHARD.

This is a seedling orchard set out thirty-three years ago, numbering one thousand trees. Many of them are choice apples and good trees.

THE BALCH ORCHARD.

This is at Weyauwega and numbers over three hundred trees, many of which are great bearers, and splendid trees, and the apples good keepers. Ten varieties were shown at the Wisconsin meeting at Green Bay, and Mr. Balch has to-day in his cellar more apples than any other man in the county. Though they lack color, and in size are not up to others of which I have spoken, his trees on the whole are a success.

THE HICKMAN ORCHARD.

This is in Fremont. It is thirty-five years old, and the trees perfectly hardy. From one of the trees Mrs. Hickman tells me they picked five barrels of apples this fall, and then shook off more than another barrel. Two of the barrels were kerosene and the others salt barrels. It bore a fair crop the year before. Although it lacks color, it is a very good tree to have this year when apples are such a general failure. This orchard stands in low, level ground.

GENERAL REMARKS.

I have never seen so many good seedling apple trees in any other quarter as these and several other orchards I might mention in Waupaca county. Our location is pretty far north, above 44°; far enough in the interior to be beyond the ameliorating influence of any large body of water; some of the orchards are on high lands with full exposures, and some on lowlands; and if cold weather is any test, we got 42° below zero last winter. Then why is it that these seedling orchards are living and thriving when so many of our standards have failed? The old Wolf River tree is alone, where three hundred other trees have died, and it is the only good tree left in the orchard where it is standing. *In every instance the seeds from which these trees were grown, were taken from fruits grown far to the north, from Maine, Northern New York and Canada east, or from trees grown here.* I think the source to look for hardy apple trees is the planting of seeds from selected northern fruits; and such seeds for root grafting are better than inferior sorts from the cider mills or any seeds from the south.

In our experiments in Waupaca county we have had many seedlings that showed tenderness and have died from time to time. By a process of selection, and propagating by root grafting, and then setting out, we have preserved the best, and obtained good orchards.

When I first came to this county, thirty-four years ago, I brought trees with me. I set the first apple tree, and raised the first apples in the county. Many of these trees are alive and healthy, and bore well this year.

DISCUSSION.

The Secretary. This paper shows the value of intelligent effort to grow seedling apples, that is by selection of seeds of the best

hardy sorts grown in the extreme north. The Wolf River Apple has been fruited several years in Iowa, Wisconsin and Minnesota. Here are samples of it, contributed by Mr. Springer, and by S. Barter of Markesan, Wisconsin. There is nothing larger in average size in our entire pomology, and its form and color are very handsome. Its red color and glossy finish are almost equal to our Wealthy, perhaps when grown here we shall find it quite as handsome. This tree is evidently of Russian blood. For years its fruit was declared by experts, whenever it made its appearance, to be the Alexander, an apple of admitted Russian origin in all the European and American catalogues. It is now admitted by all to be a distinct variety. Its distinguishing marks from the Alexander are thicker leaves and red buds. So says Mr. G. P. Pepper. It seems to have the general adaptation of the Duchess, and is said to be one of the few sorts that do well in low, sandy soils. Its quality is sub-acid and texture a little coarse, but it is a good cooking apple and fair for dessert; and if all that is said of the merits of the tree is true, it must prove a profitable market apple for Minnesota. I will add that it is also said to be at home as a top graft on Whitney No. 20.

THE NORTHWESTERN GREENING.

While speaking of the Wisconsin seedlings I wish to call attention to another one, the Northwestern Greening, samples of which I have here from the Green Bay exhibition. This is a medium to large oblong green apple. It is a long keeper and of excellent quality every way as a sub-acid cooking and dessert fruit. It is backed up by good testimonials as one of the sorts that is worthy of general trial. It was found in the north part of Waupaca county in 1872 by E. W. Daniels, of Auroraville, who bought the right to cut cions. The old tree is said to be dead; but many of its progeny are scattered about the State. It is said to be a thrifty and symmetrical upright grower, and to have the familiar ear marks of extreme hardiness. A great deal seems to be expected of it in Wisconsin. Here are specimens of its growth and union as a top graft on Transcendant, put in last spring. Mr. Plumb knows the variety well. I have given this much of a notice of it here on condition that Mr. Daniels will furnish a few trees in the spring for Mr. Gideon's experimental station, and to Professor Porter for the new University farm for trial; and while on this topic will also say that Mr. Springer will also furnish freely for the same pur-

pose cions of any of the seedlings reported on by him. My own opinion is that just as fast as we find adaptation to our climate in any of the new seedlings, the next thing we discover will be that they are of Russian blood, just as surely as we have come to know that a negro or a mulatto is an African wherever he was born; but they may have improved quality from crosses they have got, and perhaps a little improved adaptation from being seedlings; and this propagation and trial should be encouraged hand in hand with direct importations for adaptability.

Before closing this topic, here is a letter from Mr. Springer, which I will read :

LETTER FROM MR. SPRINGER.

FREMONT, WISCONSIN, January 4, 1884.

Mr. Gibbs:

There is one thing I would like to add, there cannot be too much care in selecting seed. Some say it makes no difference, but I am certain it does. Mr. A. V. Balch soon after he came to this country, (I think 33 years ago) got a barrel of apples from the old home in Northern New York. He saved and planted all the seed; they were seedlings, a large green apple. Now all his apples that he has are light colored except one, which is very dark red. He has more than one hundred bushels at this date, most of them excellent winter apples.

Now another instance: Mr. Cary Date settled here in 1851; whenever he got a high colored, hardy kind of apple he would save the seed, and he always had a few rows of seedlings from which he would select the most promising young trees and set in orchard. In this way he had a model orchard. He has the greatest per cent. of dark red, large winter apples, I ever saw in one orchard. His orchard is on land rather low, and friend Plumb's rule will not apply to this orchard at all, any more than it will to the McWhinney orchard, which is on level ground. Mr. McWhinney's orchard was planted from one kind of seed by John Baxter. The apples of this orchard are mostly large, well colored apples. This orchard is not as old as the others, and was selected from seed that grew here. I believe in selecting seed for planting orchards as much care should be take as in selecting seed corn or seed wheat--get the best.

Weather cold to-day; 28 below zero this morning. I wish I could attend your meeting; will try to another year with our apples.

Yours respectfully,

WM. A. SPRINGER.

President Harris. It is usually claimed that the color of fruit is imparted by the male parent.

The Secretary. The rule does not seem to be well defined, either in plant or animal life, at least the facts are not well enough understood to warrant any one in laying down a law in regard to it; but those which Mr. Springer mentions indicate prepotency on the mother side to stamp the color; the seeds of the green apples showing lack of color in the offspring; those of the high colored ones transmitting plenty of color. The Pewaukee apple has strong markings in color of its mother, the Duchess, and also some, apparently, from its father, the Northern Spy; its form takes after neither, but seems to revert far back, while its quality is not defined by either, though superior to the Duchess; its season is the same as the father; and the tree is the mother again in its thick, woolly leaf and freedom from rust and blight, though less winter hardy. The Gibb crab is all mother in color—not a trace of the Fall Greening, its father, in this respect. It is a bright, glossy, lasting yellow. It was from seed of the oblate yellow Siberian, fertilized by Fall Greening. Mr. Peffer is a man who is pretty sure of his facts, and I find that our best horticultural authorities in all parts of the country have confidence in what he states, and have high respect for his conclusions. He has originated not only the Pewaukee apple and the Gibb crab, but several others by hand work in propagating seedling fruits. It seems pretty sure that the constitution or hardiness comes mainly from the mother, in tree life, and the keeping quality of fruit from the father. Aside from this, it is safe to select for seed planting the sorts that are best in all other respects.

Mr. Plumb had known the Waupaca seedlings for many years. He thought their success was due largely to aspects, elevations and soils, where they grow. Only one of them showed after years of trial any general adaptation in Wisconsin. This was the Wolf River. He admitted that the owners of these seedling orchards had plenty of excellent, handsome apples.

The Secretary. The value of this report of Mr. Springer's, lies mainly in its showing of the fact that by selecting seed of good, handsome apples, these farmers out there on latitude nearly 45° had succeeded in supplying themselves with fruit. It is an encouragement to others to plant selected apple seed.

Mr. Pearce. I have the Wolf River growing on my grounds at Lake Minnetonka. The quality of the apple is not as good as the

Wealthy, but it is large, showy and productive ; the tree is hardy and has not blighted.

Mr. Plumb. The Northwestern Greening of which Secretary Gibbs has spoken is one of the new sorts of which we have high hopes in Wisconsin.

Mr. Plumb having been announced on the program for a paper on "Adaptations in Fruit Growing," then addressed the society very ably and acceptably on that subject. At the time of going to press a copy of his address had not been furnished. If received in time, it will appear in the appendix.

Colonel Stevens. In reference to one remark of Mr. Plumb in his address, I will say that late frosts in the spring and early frosts in the fall, are not common in Minnesota, and such a thing as June frost is unknown.

FLORAL OFFERING.

At this point in the proceedings a beautiful basket of cut flowers was received from R. J. Mendenhall, of Minneapolis, and presented to the society, and a vote of thanks was returned therefor.

INTRODUCTION OF CHARLES LUDLUFF.

Secretary Gibbs. Mr. President : We had before the society yesterday for the first time one of the noted fruit growers of Carver county, and gave him a cordial greeting. I see in the audience over there in the corner another one of them. I found him as I did Mr. Peterson in my searches for apples to take to Philadelphia. Mr. Charles Ludluff, will you please rise and let me introduce you? Mr. President and fellow members, this man is a farmer who lives near the village of Carver. He raises more fruit than any other man in Minnesota not a professional nurseryman, and has been at it for over twenty years, in apples, grapes, and everything. He gave us about fifty varieties of apples for the Philadelphia collection, and in a favorable apple year we we could draw on him for one hundred varieties, I presume.

Mr. Sias. I know, Mr. Ludluff's work in fruit-raising, and am glad to see him here. Our Secretary has not overstated the value of his services.

Mr. Emery. The work of these farmers in experimenting with fruits so largely and liberally as Mr. Ludluff has done is of great value, and they deserve to be classed and remembered as benefactors. Especially should we as a society welcome them among us, and I, therefore, move that, in consideration of long and distinguished service in horticulture, we tender Mr. Ludluff, as we did yesterday Mr. Peterson, an honorary life membership in this society.

The motion was adopted by unanimous vote.

Mr. Ludluff. Mr. President: It is a great honor that is here done me, and I thank the society for it. I feel an interest in your society. You are doing good work in pomology. The greatest disadvantage I see at present is the want of young men to take up the experiment in fruit raising. We must arouse them in some way, and teach them to love it and profit by it. This can be done if we try to organize societies and have meetings at home. I will do what I can for this in Carver county, and encourage our people hereafter to come to the State Horticultural meetings and read your reports.

Mr. Ludluff's paper was then read by the Secretary as follows:

REPORT ON PLUMS, CHERRIES AND APPLES TESTED IN CARVER COUNTY.

BY CHARLES LUDLUFF, OF CARVER, MINN.

To the State Horticultural Society of Minnesota:

Your Secretary asks me for an account of the cherry tree found by him and F. G. Gould in the garden of Andrew Krause, near Waconia, and for some facts about plums and apples I have tested in this county, and which were in the Philadelphia exhibit.

THE OSTHEIM CHERRY.

That cherry is the Ostheim Weischel. The original stock was sent me by a pomological friend in Germany about twenty years ago in the shape of root sprouts, and since that time I have propagated them in the same way, and had them tested in various parts

of Carver county. It is a good cherry for our climate, as the tree is hardy, a great bearer, and the fruit in favorable seasons is large and of excellent quality. Its color is dark red — very dark when ripe; form oblate; stem long; flesh, tender, sweet, sub-acid, refreshing; nearly a free stone. The tree grows better dwarf than high standard;* best soil for it is a clay with mixture of sand. If grafted, it must be on sweet cherry stocks; is a failure on the sour.

A GOOD NATIVE PLUM.

The plum I sent is a native, large, dark in color, and when fully ripe, juicy and very sweet; skin thin; worthy of cultivation by every one who has a little garden.

The time we sent our fruits to Philadelphia for the American Pomological Society, was eight or ten days too early, on account of the lateness of the season, to show many of them to advantage in size, color and flavor.

RUSSIAN APPLES.

I have planted out from time to time in the last ten years the following varieties of the Washington Catalogue:†

Nos. 183, 190, 202, 204, 214, 220, 236, 260, 262, 265, 295, 304, 330, 337, 343, 354, 367, 369, 370, 372, 382, 385, 387, 407, 430, 439, 447, 451, 458, 475, 544, 551, 569, 585, 595, 962, 965, 971, 979, 984, 985, I have root grafted trees of these, some of the older ones have borne fruit; both tree and fruit very good, but mostly summer apples. What the most of them will be I cannot tell, as they are now too young. I grafted many at first in the tops of old crab trees, and they have generally proved failures, as there is no congeniality between the cells of these different races of trees, and the sap is obstructed in its passage. I have done with top grafting. In all I think not much of these Russian kinds. The most bear summer and early fall apples. Some are very small and sour, and of such poor ones we have more than enough already. Besides many of them are poor growers. The best use we can make of

*NOTE BY SECRETARY. The dwarf must be a marvel of beauty then; for the standard one at Mr. Krause's place is the handsomest cherry tree I have seen in Minnesota.

†NOTE BY SECRETARY. Names omitted here and numbers only given, in order to economise space, as the full catalogue is to be printed to make a record of numbers and name, in the Secretary's Portfolio.

these Russian apples is to plant their seeds and raise a new stock. There may be some improvement in quality in this process, and the seedlings so produced are liable to be hardy stocks to use in propagating the best of the Russian varieties.

OTHER NEW APPLES.

Now I will give you a short description of some other apples which have not heretofore been brought to public notice. First the German Rambo and the Rembacker

In 1854 I made a visit to the old country and brought home with me cions of two hundred varieties of apples. I root grafted them that winter and in the spring of 1855 planted them out in nursery rows. They grew well through the summer, but in the spring after, half of them were dead. The second spring they were all dead except the German Rambo and the Rembacker. They were sound and good for transplanting, and so they stand with me today. The German Rambo ripens after the Duchess of Oldenburg, but keeps longer. Its form is like the Duchess and it is just as large. The color is a straw yellow, with bright carmine on the sunny side. The stem is short, and at its base in some of them is a protuberance like that of the apple called the Roman Stem; flesh white; flavor spicy. The tree is spreading in form, not a good grower for the nurseryman, and bears some fruit from the terminal buds, leaf large, strong-ribbed, woolly underneath and hardy.

The Rembacker, a brother of the German Rambo, has gone through all the winters since 1855 uninjured. The tree is slender in form like the Willow Twig, and a slow grower; bark yellow. Bears in alternate years. The apple is of medium size, green with red stripe on sunny side. Flesh white like Fameuse; flavor vinous; keeps till spring.

The Robinson is a seedling apple, raised by James Robinson of the town of Dahlgren, in this county. The tree is twenty-five years old, and a slender grower; young wood, brown; buds large; leaf large and coarse; fruit large, oblate; stem short; hangs fast on the tree; color light red with dark red stripe, and white spots over the surface; flavor vinous, growing sweeter in the spring; tree is hardy.

The Gibb apple is a hybrid. I got this from our friend, the veteran pomologist, G. P. Pepper, of Pewaukee, Wis., several years ago. The tree is a slow grower but very good bearer. Cions are woolly towards bud at the tips; buds and leaf large; fruit medium to

large for a crab; color yellow; some specimens have a red cheek on the sunny side; flesh yellow; flavor vinous, refreshing. Good for cider and wine; season late fall; tree very hardy.*

The Barkeeper apple is a variety I got from my old friend, that other veteran pomologist, Peter M. Gideon, of Excelsior, several years ago. I have it as a top-graft only. Cannot tell what it will be when root grafted. Looks like a fast grower. The fruit is large; color, grass green all over, with white spots; stem short; hangs fast on the tree. Flesh, coarse; flavor vinous; tree very hardy.

In reply to a question, Mr. Ludluff said his orchards were on deep black soil with clay subsoil. No shelter except gray willow on the north.

Mr. Plumb was in favor of windbreaks, but not of close shelters for orchards.

FINANCIAL MATTERS.

A report was presented by the finance committee embracing the following points, given from memory by the Secretary, as the papers could not be found after the adjournment of the meeting.

1st. Finding the accounts of the Secretary and Treasurer agreeing and correct as presented.

2d. Reciting a by-law in the Annual Report of 1878, limiting the executive committee to \$50 per year in the current expenses of the society, and alleging that this by-law had been violated in the expenditures for the collection and exhibition of fruits at the meeting of the American Pomological Society, in September last.

3d. Intimating a tendency to extravagance, the spending of money because we had it—a tendency that the committee thought needed checking.

The report was signed by G. W. Fuller, A. W. Sias and M. Pearce.

* NOTE BY SECRETARY. This apple was originated by Mr. Pepper from the oblate yellow crab, fertilized by Fall Greening apple. Its merits were first recognized by Charles Gibb, of Abbotsford, Canada, who selected it as the most promising at the time of a row of seedlings shown him by Mr. Pepper. Hence its name. The tree has never been known to blight so far as records have been obtained, and the apple has, besides the good qualities named by Mr. Ludluff, the faculty of staying firm outside and in, and holding its bright, yellow color all through the fall and early winter. It must be a valuable crab for market, and like the Whitney No. 20, a profitable one to raise for selling to the dryers. It was one of the three most attractive crabs in appearance on our tables at Philadelphia.

Mr. Pearce arose and stated that he dissented entirely from all of the report except that part agreeing to the correctness of the accounts of the Secretary and Treasurer. He was a member of the executive committee; was not present at their meeting in August, but approved their acts. He did not see how any committee could have acted differently.

Mr. Underwood. As chairman of the executive committee, I will say that the finance committee appears to have overlooked the fact that the action of the executive committee was fully authorized by resolution of the society last winter, which will be found on page 137 of the report of 1883, and also that the understanding was the same at the meeting in June last, without a dissenting vote at either meeting. If anybody has violated this old forgotten by-law, adopted when we had no funds but membership fees and not much of that, it is the society itself, not the committee; and it has been doing this outrage on itself every year for three or four years past, ever since we got our State appropriation.

What does the finance committee think we could have done in this Philadelphia business, anyway, with fifty dollars? Or how could we have got out our premium lists and paid our awards? If this report is made in earnest, and anybody is really dissatisfied, the members of the executive committee are ready to foot the whole bill and take it all in stock in the medal.

C. L. Smith. It appears that the cost of the collection and exhibit, delegate's expenses, etc., is less than \$400, and of this \$200 was paid by the Governor. Instead of any idea of extravagance, I have often heard expressions of surprise that so much could have been done with so little money.

Col. Stevens. The general opinion is that the whole matter was well devised by the executive committee, and well and economically managed by Mr. Gibbs. The State is proud of it, and delighted with the honors paid us in the award of the medal. It is worth to the State of Minnesota all that this society has cost in seventeen years.

Truman M. Smith. If there is any fault it is with the society.

Mr. Gould read the resolution of last winter referred to by Mr. Underwood.

C. L. Smith. I move that so much of the report as approves the accounts of the Secretary and Treasurer be adopted, and the rest of it be stricken out.

Mr. Fuller. I will say for the committee that we have acted conscientiously in this matter. We found the by-law, and we also

had before us an expenditure greater than \$50 per year, and felt it to be our duty to call attention to it.

The motion of Mr. Smith was then unanimously adopted, and it was further voted that the by-law referred to be amended by inserting \$500 in place of \$50, and that the executive committee be authorized to expend that amount annually, at their discretion, for the current expenses of the society.

Mr. Mendenhall. In order to make the record complete, and promote good feeling in this matter, I offer the following resolution.

WHEREAS, This Society has made an exhibition of the fruits of Minnesota at the recent meeting of the American Pomological Society, and whereas the Wilder Silver Medal was awarded the Society thereon ; therefore,

Resolved, That the action of the executive committee in authorizing the expenditures that were made, and of our Secretary in his capacity as delegate, be indorsed and approved.

The resolution was unanimously adopted.

AFTERNOON SESSION.

Third day, Thursday, January 17th.

Music by the University Glee Club.

Prof. Hall's address having been made the special order for this afternoon, was then delivered as follows :

[See appendix for this address.]

Prof. Folsom. Can you give us something authentic on the necessity of tree planting on the prairies to induce greater moisture?

Prof. Hall. It is the universal observation that in regions of forests the rainfall is greater in the annual average, more evenly distributed, and the climate more equable. The planting of trees is certainly recommended to bring about these desirable results. Nothing conserves moisture so much as vegetation. Nothing collects and holds it better than a forest. Every leaf is a thirsty throat, asking water. Blue-stem among the grasses indicates an increase of moisture.

Secretary Gibbs. It is the opinion of scientists who make a study of forestry in connection with meteorology, that thirty per cent. of our western regions must be kept in forests in order to induce and equalize moisture sufficient for agriculture and to maintain our streams of water for navigable and manufacturing purposes and also to offset the waste of moisture consequent upon the destruction of the grasses by cultivation of grains and by the drainage of marshes. It is also believed that the yearly increase of devastating floods in our great river valleys and along the smaller streams—even in the dry runs of our bluff lands—is due to man's disturbance of the balance of nature by clearing the slopes at their sources and along their inlets, and some go so far as to assert that

the unequal rain and snowfall, the cloudbursts and deluges that we hear so much about on the one hand, and the no less destructive, but less terrible drouths on the other hand, are due to this clearing of woodlands, destruction of grasses, and draining of marshes; increasing aridity of air being followed by lower temperatures, and this by sudden and enormous condensations of masses of moisture brought in by ocean currents, producing deluges of precipitation. These prophets of Nature have predicted for many years past (and appealed in vain to the government to prevent) such floods as that of last year and the year before on the Missouri and the Ohio, and worse to come. Already many of our small valleys in Minnesota and Wisconsin along the Mississippi river, which in the days of early settlement were the most sought after of all our lands, are now held by their owners with constant dread and peril of their lives or property; some homes once thought secure, already abandoned; while farmers who live above them on the slopes that feed these valleys are complacently allowed to go on clearing and smoothing the slopes and completing the ruin of their neighbors below, and hastening the time when they must leave their own lands for want of water, whose sources they have destroyed. Already it is said that the timber of the eastern slopes of the Rocky mountains has been nearly destroyed by the necessities of mining industries and the fires that are allowed to follow the axe of the woodman; and the terror of increasing floods grows upon the people living in the Missouri and the Mississippi valleys in consequence, while year by year vast districts in these valleys are to become uninhabitable that nature designed for the richest and most productive abiding places of man. It does seem as if our people might soon begin to realize these things and demand of the general government an arrest of this mad work.

A vote of thanks was tendered to Professor Hall for his able address, and he was requested to prepare a paper for our next annual meeting on the subject of climatic influences of forests.

Prof. Porter called attention to the meeting of the State Amber Cane Association, to be held next week at the State University, especially to the expected lectures of Prof. Wiley, of the U. S. Department of Agriculture, upon new and improved methods in the manufacture of sorghum syrups and sugars, to be delivered before the Association. A cordial invitation was extended to all to attend the meetings.

The election of officers for the year 1884, was then proceeded with by ballot and resulted as follows, all the elections being declared unanimous :

President—TRUMAN M. SMITH, St. Paul.

Vice-Presidents—A. W. SIAS, Rochester ; E. H. S. DARTT, Owatonna ; F. G. GOULD, Excelsior ; G. W. FULLER, Litchfield ; A. H. REED, Glencoe.

Secretary—OLIVER GIBBS Jr., Lake City.

Treasurer—J. T. GRIMES, Minneapolis.

Executive Committee—President, Secretary and Treasurer, and J. S. HARRIS, La Crescent, R. J. MENDENHALL, Minneapolis, C. L. SMITH, Minneapolis, J. M. UNDERWOOD, Lake City, W. E. BRIMHALL, St. Paul.

A draft for new constitution and by-laws was presented by the Secretary, and on motion referred to R. J. Mendenhall, Wyman Elliott, G. W. Fuller, J. M. Underwood and A. W. Sias, as a committee to report at next meeting.

The following telegram having been brought in :

DES MOINES, Iowa, January 17, 1884.

To the Minnesota State Horticultural Society, in session at Minneapolis :

The Horticultural Society of Iowa sends greeting. We join hands with you in common endeavors to raise the standard of horticulture in our respective States.

J. J. WRAGG,

E. R. SHANKLAND,

Committee.

Was received with applause, and the secretary being instructed to return our greetings in the same spirit, answered as follows :

COLLEGE OF AGRICULTURE, }
Minneapolis, Jan. 17, 1884. }

To the Iowa State Horticultural Society, in session at Des Moines :

Telegram of this date received, and sentiments cordially reciprocated by the Minnesota Horticultural Society. We are BUDDING some of your ideas on hardy stocks.

OLIVER GIBBS, JR.,

Secretary.

Delegates were elected to other horticultural societies as follows :

M. Pearce, Oliver Gibbs, Jr., and E. H. S. Dartt, to the Mississippi Valley Horticultural Society, next week.

G. W. Fuller to the Iowa State Horticultural Society, next year.

A. W. Sias to the Wisconsin State Horticultural Society, in February of this year.

The Secretary stated that he should attend the Kansas City meeting as U. S. Commissioner for the New Orleans World's Exposition, and should not need to present any bill of expenses to this society.

The committee on the Secretary's report, submitted the following:

Mr. President and Members of the State Horticultural Society:

Your committee to whom was referred the recommendations of the Secretary have had time only to consider a few of the points presented, but so far as we have taken them up, agree as follows:

1st. That the sum of \$100 should be appropriated annually for expenses of sending out our annual reports, until such times as we may have local auxiliary societies to attend to their distribution.

2d. That some plan should be devised by the society or by the executive committee for increasing our membership, and also for the procuring and proper distribution of seeds and cions.

3d. That the Secretary's suggestions for extending our exchanges of horticultural reports, so that all our members can be supplied with reports of other societies, is approved.

R. J. MENDENHALL, }
TRUMAN M. SMITH, } Committee
EDWARD D. PORTER. }

On motion the report was adopted.

EVENING SESSION.

Third Day, January 17th.

E. H. Cuzner was appointed librarian for 1884; \$10 voted him for services since the death of Mr. Bowen to date, and \$15 for book case and repairs in the library room.

Mr. Messmer then read the following paper on roses, the author not being present.

ROSES IN THE NORTHWEST.

BY SAMUEL BARTER, OF MARKESAN, WISCONSIN.

[This paper was read at the Green Bay meeting of the Wisconsin Horticultural Society, in December, and is reproduced here by courtesy of the Secretary, Prof. William Trelease, and by permission of the author.]

That roses can be successfully grown in every part of the Northwestern States is fully demonstrated by the experience of all who have been earnestly engaged in their cultivation.

Much has been written on the subject of roses, but most of the articles that I have seen published apply to their cultivation in the Eastern States, mainly to the state of New York.

I wish to discuss the subject from a northwestern standpoint, and what information I may be able to impart is given as the result of my own individual experience and observation.

Now that the summer and winter protection of the rose bush is no longer an experiment in this region, the wonder is, that so few of our homes are decorated and enlivened by the presence of this beautiful flower in their surroundings. Said a lady, when speak-

ing of beautiful surroundings: "Whenever I pass by a home with beautiful flowers, I always think they are nice people who live there." This sentiment is doubtless recognized by us all, though perhaps not always so candidly expressed.

The multiplicity of names given to the different classes of roses such as Tea Roses, Hybrid Perpetual, Bengal, Bourbon, Noisette, &c., while they may be understood by the professional florist, are certainly very confusing to the amateur.

For the information of the general public, I prefer to class them as hardy and tender roses and subdivide them into three kinds, viz: the annual or June roses; the occasional bloomers (known as Hybrid Perpetuals) and the ever-blooming roses, the latter kind being nearly all too tender to survive our northwestern winters, when left in the ground.

The June roses and Hybrid Perpetuals are all hardy and can be easily protected in the winter—the same bushes continuing for a number of years to produce a rich abundance of beauty and fragrance.

I will name a few of the June roses that bloom only once in each summer. This includes all the moss roses, the yellow and white Scotch roses, Madame Plantier (the best of white roses) Seven Sisters, Cinnamon rose, Hundred leaf rose, &c.

The best of the occasional bloomers or Hybrid Perpetuals that have been grown under my observation are Louis Odier, Joseph, Paxton, General Washington, General Jacqueminot, La France, and Madame Charles Wood. These are the most profitable kinds of this class of roses to cultivate, as some of them will be likely to produce buds and blossoms continuously from June to October.

Of the tender roses known as "Ever Bloomers," there are many beautiful specimens. Perfect roses are often grown on young and very small bushes; they produce some exquisite gems of beauty during the summer, but the plants must be dug up and set in boxes of earth to be housed during the winter.

The following are the names of a few of the best kinds: Pearl-Des-Jardins, Madame Lambard, Etoile de Lyons, Malmaison, Safrano, the Palymantha or Miniature roses, Madame Wetteke, Marshall Neil and Dutchess-de-Brabants.

I have been very successful in the cultivation and protection of the above-named rose bushes. I have not the least fear of any of the hardy kinds being winter killed. My mode of protection is very simple, and attended with but little trouble. Simply bend the

bushes to the ground, secure them there with some stakes and cord, or lay some sticks of wood on them and cover over with straw.

They should not be covered too early in the fall. From the 1st to the 10th of November is the best time. One or two hard freezes will not injure them. My experience teaches me that they will safely endure a zero test in the Fall.

The bushes should be uncovered and straightened up in the spring, from the 1st to the 10th of April, each bush being tied to a stake or other support driven in the ground.

Rose bushes have been subjected to a test of temperature as low as 22° above zero, after being raised in the spring without injury. The mode of protection for the tender or ever-blooming roses attended with the least trouble is to keep them in flower pots or wooden boxes in the cellar in the winter, putting them in about the 15th of October and taking them out some time in April or the beginning of May. Set the boxes in the ground without removing the plants from them. The rosebush having few or no fibrous roots almost invariably loses its leaves by transplanting, and sometimes its life. The summer care and protection of rose-bushes of all kinds is attended with but little trouble if prompt attention is given them at the proper time. They thrive best in rows or beds. It is a good plan to spade up the ground in the spring between the rows and hoe a few times during the summer to keep out the weeds.

About the first of June a small insect appears on the leaves of the rose bush so minute at first that it can hardly be seen without the aid of a magnifying glass; but it grows rapidly and multiplies fast. It honeycombs the leaf, and, if appearing in sufficient numbers and left undisturbed, it will soon sap the life of the bush. This insect is known as the rose slug, and is the only real formidable summer enemy of the rose bush. It is a small worm, its natural growth being about one half an inch in length. This insect can be very easily destroyed, and as there is only one crop of them it does not require constant watchfulness. Many things are recommended for their destruction. It is said fine road dust will destroy them. White Hellebore will kill them, but a little Paris Green mixed with water, in the proportion of a tea-spoonful to a ten quart pail of water and applied to the bushes with a whisk or sprinkler will act on the slugs like magic, generally destroying them all with a single application.

All kinds of roses can be propagated by layering. This is probably the easiest and best method for amateurs who wish to increase

the number of their bushes for themselves or for the purpose of donating to friends. The process is easy and simple. Choose one of the new shoots of the bush starting out near the ground, dig a small trench in the ground and bend the shoot down into it, being careful not to separate it from the parent bush, cut into the shoot from the under side about three-fourths of an inch below each joint up to the center of the joint, being careful not to cut it entirely off. Fasten the shoot firmly into the trench with hooked sticks and cover with earth. This can be done at any time in the spring, summer or early fall. When well rooted, a separate rose bush can be cut off and dug up from each joint of the shoot.

Rose bushes should be moved or transplanted early in the spring before a new growth is started; in this way they will sometimes bloom well the same year.

The ancient poets say that the first rose was brought into the world by the "god of love," and the occasion was a desire to bribe Harpocrates, the god of silence, to an engagement that he would discover none of the secrets of Venus. Hence it became a custom to place a *rose* in rooms devoted to mirth and entertainment as a symbol in the presence of which all restraint might be laid aside; accordingly the proverb under the rose denote secrecy and inviolable silence. The rose is also from the same cause the direct emblem of silence. Besides the use of the rose at the feasts convivial meetings of the ancients, it was also frequently laid upon the tombs of the dead either to signify the silence of death, the nightingale in another to be chosen with, or as an offering grateful to the deceased. I quote from "Poetry of Life," published more than thirty years ago by Miss Sarah Stickney, the beautiful language that a lady only can use.

"From the majestic sunflower towering above her sisters of the garden, and faithfully turning to welcome the god of day to the little humble and well-known weed, that is said to close its crimson eye before impending showers, there is scarcely one flower which may not from its loveliness, its perfume, its natural situation or its classical association, be considered highly poetical. The 'lady rose,' as poets have designated this queen of beauty, claims the greatest consideration in speaking of the poetry of flowers. In the poetic world the first honors have been awarded to the rose, for what reason it is not easy to define, unless from its exquisite combination of perfume form, and color, which has entitled this sovereign of flowers in one country to be mated with the nightingale, in another to be chosen with the distinction

of red and white as the badge of two honorable and royal houses. The common wild rose is produced without the aid or interference of man. Blooming in the sterile waste, this lovely flower is seen unfolding its fair leaves where there is no beauty to reflect its own, and thus calling back the heart of the weary traveller to thoughts of peace and joy, reminding him that the wilderness of human life, though rugged and barren to the discontented beholder, has also its sweet flowers not the less welcome for being unlooked for, nor the less lovely for being cherished by a hand unseen."

Friends, the rose still maintains her supremacy in every part of the world. She has long been recognized as queen of all the floral kingdom, and, while we concede to all the flower producing plants the full measure of praise for their numberless beauties, peculiarities and attractions, we should accord to the rose the tribute of our highest admiration and cheerfully welcome her to our homes and surroundings. Give her the care and protection which is so essential for her success in this, our Northern clime, and she will bountifully repay us with a brilliant display of her unrivaled glories in the coming joyous summer days.

"From the weather-worn house on the brow of the hill,
We are dwelling afar, in our manhood to-day;
But we see the old roses and hollyhocks still,
As they looked when we left them to wander away.
Farewell to the friends of our bright boyhood days,
To the beautiful vales where the roses did bloom;
To the fathers, the mothers, now gone from our gaze,
From the weather worn house to their Heavenly home,
Where they wait, where they watch, and will welcome us still
As they waited and watched in the house on the hill."

Following Mr. Barter's paper, the following was read:

NOTES ON ROSES, BY THE SECRETARY.

A choice list of roses was given in Dr. Mead's paper, page 310 in our report for 1883. In my visit to Washington, in September last, I saw the Bancroft Rose Garden, and spent some hours in it with Dr. Mead, under the guidance of Peter Carroll, the gardener, and John Brady, the rosarian mentioned by Dr. Mead. Some extracts from my note-book may be of interest in this connection:

The La France, at Mr. Bancroft's garden, develops a climbing habit when grown under glass, where it does better than out of doors.

The best tea rose is the Catharine Mermet, a creamy, pinkish white. This is the great historian's favorite.

A lovely purplish rose with a fruity fragrance is the Aline Sisley.

The Adam is a delicate double flower, but a profuse bloomer; color a light pink.

The Countess de la Barthe, a creamy pink; very fine.

Madam Lambard, a deep pink.

Captain Christy resembles the Victor Verdier in growth of bush. It is a large rose, of a delicate white pink color, very rare and choice. It has a marked expression of its own among a collection of plants, from its peculiarity of blooming from the terminal bud.

The best white hybrid perpetual is the Mabel Morrison.

Mr. Brady showed me at his own place what seemed to me to be a remarkable growth from budding of the rose. This was a *Devoniensis* worked on a branch of the *Solfaterre* about four feet from the ground. The bud was inserted about the middle of August. On the 18th of September, when I saw it, the branch grown from this bud had twenty-one well developed flower buds on it, and one open bloom. Ordinarily the *Devoniensis* is a weak grower, but on this stock it is rank and vigorous. The flower is creamy white and very large, sometimes four inches across its face, and the petals are of great substance. It is known as the *Magnolia* rose, from its large size and sweet heavy fragrance.

Mr. Brady has grown the *Solfaterre* one hundred feet long.

In the course of some manual lessons he gave me in budding the rose, I asked him what we could use to advantage for stocks in Minnesota to increase our list of garden roses by budding.

"You have the Sweet Briar in your country?"

"Yes."

"It is a free seed-bearer with you?"

"Yes."

"Grow seedlings from it. Put away the seeds in damp sand in the fall. Plant them out in the spring. When they are sufficiently grown, bud into them near the ground, as low down as you can work them. These stocks are hardy and vigorous and will not sucker from the roots."

In a note received from Mrs. Isaac Atwater, who furnished the excellent paper on roses at our winter meeting in January, 1881, her note being written in reply to an invitation to write us another paper, this lady says:

"If you have a discussion on rose culture do please insist on the absolute necessity of the close pruning of remontant roses.

Many people in Minneapolis have more or less varieties of these roses, but one scarcely ever sees a bloom on them except in the spring, making them of no more value than a June, while my remontants were always in bloom from June till October, more especially the General Jacquiminots, the result of constant and severe pruning. I was experimenting with some new remontants the season before we sold our place, and found one—Madame Marie Tuiger—a very choice acquisition, an improved (if possible) La France, and another, I am not quite sure of the name, but think it was Adele Carriere, was a lovely rose and a constant bloomer."

Referring again to Dr. Mead's contribution last year, on rose culture, I give here another letter from him on the same subject:

LETTER FROM DR. MEAD.

WASHINGTON, D. C., Jan. 3, 1884.

Secretary Gibbs:

In reply to yours requesting some further notes on rose culture I have only to say that the last year was not a good rose year for this part of the country, and we were obliged to put up with many disappointments. I have no reason to lower my praise of any that I mentioned before; but believe that if we would grow our teas under glass we would get much more satisfactory results than growing them in the open border,—still as but few of the real lovers of the rose are able to grow them in this way, the greatest benefit will be done by a systematic study for the purpose of ascertaining which roses will prove the best for out-door culture in different sections of the country. Here we get very good results with the Marshal Niel grown out of doors with protection in the winter. As the thermometer seldom gets below zero here, very little protection is required, the main point being to keep it from freezing and thawing, as it is this process that kills plant and tree life more than the simple freezing. Solfaterre, another choice Noisette, does well in the open border with slight protection. Of course neither of these would live through your hard winters thus treated, and occasionally they are greatly injured here. Of the teas very few need any protection. Last winter I covered my Perle des Jardins and Jean Pernet with a few others, but do not think they were very much benefitted thereby. For this winter I simply bent the tall growers to the ground and shall let them so remain till spring, except with Marshal Niel. As the teas are such lovely roses, so sweet, beautiful and prolific, I think you could well afford to cultivate them even though you should have to raise them in the fall and place them in your cellars during the winters. By this process you would lose some, but after a few years thus treating them, you would learn their habits and requirements so that the loss would be reduced to a minimum. The secret would be to let the wood get well ripened before lifting, and then placing them in a light room (cellar) with sufficient moisture to keep the roots from becoming dry. They should not be planted out before all

danger of severe frost is over and then pretty well cut back. I believe that in this way you could raise teas in your gardens and have as good specimens as we can here. As your season for blooming is shorter than ours, very likely you would average better blooms than we get. The hardy hybrids might be bent close to the ground, well hilled up about the roots and then all covered by straw in such a way that the water would run off, or away from the bush; and I think you would have little loss by this means. The greatest danger in this would be from too early uncovering. This should not be done until the weather has become warm and all the frost is out of the ground. Neither should they be raised from the ground as soon as uncovered. These are the opinions that I have arrived at in my experience; however, you may find them impracticable in your state.

I have received your circular containing programme, &c., of your next meeting. I would like very much to be with you, for I have come to the conclusion from reading the volume containing the minutes, &c., of your last meeting, that yours is a live society, and that you are after *facts* first and theory afterward. Still a man without a theory will not make much of an investigator.

I see that Ellwanger & Barry, of Rochester, have succeeded in raising two new roses, one a hybrid, raised from the seed of General Jacqueminot and named Marshall P. Wilder. It is described as an improved Alfred Colomb, and they (E. & B.) believe it to be the best American Rose yet raised. I have great confidence in the opinions of these gentlemen, and do not believe they would wittingly misrepresent any rose, or in fact anything. And as they have had it on trial for several years, I have no doubt this will prove all they say about it. The other is a miniature rose of slender growth and raised from the seed of the Marie Van Houtte, and called Rosalie, or Fairy Queen. I have seen neither of these and therefore say nothing of them from my own personal experience, but as they are recommended by E. & B. I have no doubt of their excellence.

I see by your programme that you will have two papers on subjects especially interesting to me, and shall wait perhaps impatiently for your report to read them. I refer to the one on "Wild Flowers of Lake Pepin Valley" and the one on "Roses for the Northwest." I hope neither will prove only for the ear, and then to be forgotten.

THEO. MEAD.

MINNESOTA SEEDLING APPLES.

A letter was read from J. M. Thresher, of Fillmore county, answering inquiries of the Secretary in regard to the Rollins apples. He says the Rollins Russet and Rollins Prolific seem to stand well, but himself and neighbors have not had good success with the Rollins Pippin.

TIDINGS FROM CALIFORNIA.

An interesting letter was read from Wyman Elliott written at Santa Monica, California, in which he described the horticulture of California as he found it.

THE FORESTRY ASSOCIATION.

The Secretary stated that from present appearances there was not likely to be much of an attendance from the Forestry Association at the proposed joint meeting to-morrow, and recommended that we proceed with our regular program, and take up Forestry when we reach it in the course of business. This was agreed to.

THE GOVERNOR'S VISIT.

The Secretary also stated that it had been the desire and expectation of Governor Hubbard to be present at one session of our Society this week, and at the joint meeting on forestry, but the fire at Stillwater had thrown a mass of business suddenly upon the Governor, and he was much pressed for time ; was even now necessarily away on a trip to Chicago, and it was not likely he would return soon enough to make us his contemplated visit.

AWARD OF PREMIUMS.

The award of premiums was then read, as follows :

APPLES.

	Premium.	Am't.
Display Wealthy, Charles Gould.....	1st	\$4 00
Display Wealthy, Andrew Peterson.....	2d	3 00
Display Wealthy, P. M. Gideon.....	3d	2 00
Plate Wealthy, Underwood & Emery.....	1st	2 00
Plate Wealthy, Charles Gould.....	2d	1 00
Plate Wallbridge, E. Wilcox.....	1st	2 00
Plate Wallbridge, O. Gibbs.....	2d	1 00

Plate Utter, O. Gibbs.....	1st	\$2 00
Plate Talman Sweet, George J. Kellogg.....	1st	2 00
Plate Talman Sweet, J. S. Harris.....	2d	1 00
Plate Wolf River, S. Barter.....	1st	2 00
Plate Northwestern Greening, E. W. Daniels.....	1st	2 00
Plate Pewaukee, George P. Pepper.....	1st	2 00
Plate Krause Seedling, Andrew Krause.....	1st	2 00
Plate Orange, Underwood & Emery.....	1st	2 00
Plate Minnesota, Underwood & Emery.....	1st	2 00
Plate Minnesota, L. E. Day.....	2d	1 00
Plate Scott's Winter, Underwood & Emery ..	1st	2 00
Plate Red Anis, Underwood & Emery.....	1st	2 00
Plate Crab Seedling, S. Bates.....	1st	2 00
Plate Roman Stem, S. Bates.....	1st	2 00
Plate New Codling, S. Bates.....	1st	2 00
Plate Forster's Sweet, William Forster.....	1st	2 00
Plate Seeknofurther, S. Bates.....	1st	2 00
Plate 240, Lieby,	} A. Peterson...	Special 8 00
Plate 378, Hibernial,		
Plate 410, Little Seedling,		
Plate 272, Ostrekoff Gloss,		
Plate Asfeld Seedling, Charles Ludluff.....	1st	2 00
Plate Robinson Seedling, Charles Ludluff.....	1st	2 00
Plate Seedling (4 entries), J. C. Kramer.....	1st	8 00
Plate Seedling, Phil Everhard.....	1st	2 00
Plate Seedling, Joseph Wright.....	1st	2 00
Plate Seedling, Joseph Wright.....	1st	2 00
Plate Waupaca Seedling, W. A. Springer.....	Special	2 00
Plate Fameuse, L. E. Day.....	1st	2 00
Plate Fameuse, E. Wilcox.....	2d	1 00
Plate La Crescent, E. Wilcox.....	2d	1 00
Plate A. S. Winter, L. E. Day.....	1st	2 00

VEGETABLES.

Winter squash, J. T. Grimes.....	1st	75
Winter squash, J. T. Grimes.....	2d	50
Half peck early potatoes, K. H. Whipple.....	1st	2 00
Half peck winter and spring potatoes, O. Gibbs	1st	2 00
Half peck winter and spring potatoes, J. T. Grimes.....	2d	1 00
Half peck table carrots, K. Whipple.....	1st	75

PANTRY STORES.

Display canned fruits, W. Golden.....	1st	3 00
Display canned fruits, J. F. Hosmer.....	2d	2 00
Sample of home-made vinegar W. Golden.....	1st	1 00
Sample home-made vinegar, K. H. Whipple..	2d	50
Sample strained honey, L. E. Day.....	1st	1 00
Sample strained honey, Charles Ludluff.....	2d	50
Sample preserved rhubarb, E. H. Cuzner.....	1st	1 00

WORKS OF ART.

Collection of paintings of Minnesota fruits and flowers, Mrs. West....	1st	\$5 00
Single fruit painting, Mrs. H. B. Sargeant.....	1st	3 00
Single fruit painting, Mrs. W. W. Folwell.....	2d	2 00

SEEDS.

Collection of Minnesota-grown garden seeds, E. Webster.....	1st	6 00
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Following the awards of premiums, the committee submitted the following special report:

REPORT OF COMMITTEE ON EXHIBITS.

Your committee on exhibits and awards at this meeting would submit the following:

1st. We find about fifty varieties of home grown apples and Siberians on exhibition, which in point of all the essential qualities of size, beauty and flavor, are of superior excellence, and would do honor to the winter exhibit of any Western States, and are very encouraging to the Pomologists of this State.

2d. We find worthy of special mention, the exhibits of new varieties, seedlings of this and other states, with some of the new Russians, of great beauty and excellence, among which we notice the collections of Andrew Peterson, of Wauconia, and Charles Ludluff, of Carver, which are a lesson worthy of careful study by our members. We also would mention the show of Wolf River and Northwestern Greening, from Wisconsin, which promise especial merit to this State. Also the spicy seedling of William Forster, of Chatfield.

3d. We also would give special mention of the wondrous imitations of nature in the fruit and flower pieces on exhibition from our home artists, Mrs. West, Mrs. Sargent and Mrs. Folwell, which are "true to life," and worthy of a place in every collection of home decorations, and especially worthy for the educational effect upon the people.

J. C. PLUMB,
F. G. GOULD,
E. D. PORTER,
Committee.

Messrs. Plumb and Gould of the above committee, also reported complimenting the handsome exhibit of forty varieties of potatoes grown at the State University farm, under the charge of Prof. Porter.

MORNING SESSION.

Fourth Day, Friday, January 18th, 1884.

THE SUMMER MEETING.

At the opening of the session to-day, Truman M. Smith, of St. Paul, the newly elected President, took the chair. Prof. Porter introduced the subject of the Summer Meeting, and hoped we would have a program of more general interest than we had last year. He thought we might vary the usual exercises by visiting the market gardens and fruit farms of both Hennepin and Ramsey counties. "For myself," said he, "I would rather spend one hour on the grounds of a practical horticulturist than to hear him talk ten days."

THE NEW UNIVERSITY FARM.

"And while I have the floor," Prof. Porter continued, "I will invite your attention for a few moments to the New University farm. The objects of the farm are three-fold:

1st. To illustrate the class work of the lecture rooms; 2d. to make experiments in the practice of agriculture in all its departments; 3d. to carry on original investigations and establish correct principles. We have the best location in the State of Minnesota for such a farm and experiment station. It is midway between the two great cities of the State; it has every variety of soil and exposure; is abundantly equipped in every way, and has the full and cordial support of the Board of Regents. The farm is

new, as you are aware, having been purchased but a year ago, when the old farm was sold. The past year we have been occupied in the erection of buildings, and getting the farm in order. We hope to have things in shape by the time of your summer meeting, to show at least a commencement of our work. I hope you will not forget that by the acceptance of the invitation given you last summer, the members of the Horticultural Society are to be our guests at the farm at the time of your next Strawberry meeting. We shall then, as now, and at all times be glad to receive any advice or suggestions you or any one may have to offer for the management of the farm, or in reference to any experiments you desire to have made in agriculture or horticulture, and especially we solicit seeds, cuttings, plants, trees, etc., for trial. We will propagate every thing in this line found worthy, and distribute for the best interests of the people of this State."

Prof. Porter offered samples of the new varieties of potatoes on exhibition to any who might want them for trial.

Mr. Harris. I commend most heartily this farm and the suggestions of Prof. Porter to the members of this Society. As horticulturists we can help the State University and Prof. Porter in carrying out their plans in regard to it, and on the other hand we can look to it for systematic work and careful records in all the experiments in which we are interested. The farm consists of 260 acres. It has cost from \$200 to \$300 per acre, but by the rise in the value of lands is now worth \$500 per acre exclusive of improvements. The farm in many respects is one of the best anywhere; and when its buildings and equipments are completed, it will be the best of its class in the country.

Secretary Gibbs. I have always thought well of these experimental farms, but have never so fully realized their importance and usefulness to the public as I have since visiting the New York experiment station at Geneva on my return from Philadelphia last fall. Dr. E. Lewis Sturtevant, the director, gave me half a day of his time in showing me around the farm and explaining the experiments that were being carried on; and I came away fully convinced that if our farmers would visit these experimental farms and agricultural colleges, and get really acquainted with their purposes and their practical workings, it would not be long before their boys would be flocking there for a better education in farming, as they do now to the classical colleges to learn to be doctors and lawyers.

The State Horticultural Society will expect great things from this University farm in its departments of pomology and gardening, and it is safe to say that our members will always be found its cordial co-workers and supporters in every step to advance the standard in these departments. I only hope the other branches of agriculture will organize as efficiently and co-operate with the management of the the farm as thoroughly as we will.

HALL FOR FUTURE MEETINGS.

Prof. Porter. I wish to say a word further in regard to the home of this society here at the Agricultural College. The Board of Regents takes note of your largely increasing numbers, and of the necessity for providing a hall large enough to accommodate not only this society, but all other assemblies or societies that come here in the interest of agriculture; and it is hoped that before your annual meeting occurs here again they may be able to offer you a hall that will accommodate any audience you can bring. The appropriations have been made for all necessary buildings in addition to what we have, but we have been and still are delayed in getting the money by the burning of the State buildings, and the extraordinary drafts for funds to rebuild them.

A. W. Sias here presented to Prof. Porter the relics of the Rochester tornado, and Mr. Harris the specimens of Minnesota woods on exhibition, for the benefit of the Agricultural College Museum.

The Secretary reported progress for himself and Prof. Porter as a committee to select a device for a seal. Nothing had been evolved that was quite good enough to express our high aims, ambitions and hopes; the best they had to offer was the figure of a young girl on tiptoe under an apple tree, one hand bending down a branch, and the other grasping an apple. If this were engraved with a motto, "Reaching for Fruit," in good Latin, it would at least be expressive. The picture was handed around for inspection, and taken under advisement for another year. Meantime *sealed* proposals for furnishing a better device are solicited.

THE RUSSIAN MULBERRY AGAIN.

A resolution having been offered by R. Porter declaring the cultivation of the Russian mulberry to be a humbug, Col. Stevens said there was no doubt about its hardiness. To be sure it would kill down some when young, but would grow up again and soon get over that. He put out one hundred of them five years ago, and they were all living. The Mennonites who brought them to Minnesota grow them largely at Mountain Lake. He had been there to see the trees and found the tallest one thirty feet high. They make good hedges, and the fruit is desirable. Would not recommend it for a shade or ornamental tree.

Mr. Emery drew a diagram on the blackboard and explained the manner of growth of the mulberry. It is close-jointed, hardy, an excellent wind-break and the natural food of the silk worm. It can be grown from cuttings, but not successfully except with the best of facilities and expert care. We advise the ordinary planter to get roots every time. The silk work industry promises a new and paying employment, especially for women, and we want the mulberry. Keep it, encourage its planting, and it will bring us good returns for our care and money.

Mr. Whipple thought it could be successfully grown from cuttings. From one hundred cuttings he had raised twenty-seven healthy trees.

Mr. Sias concurred in this opinion.

Mr. Fuller had made a failure of it with both roots and cuttings. The trees had killed to the ground in winter.

Prof. Porter thought the Russian mulberry contained germs of inestimable value here. Besides its use as the food of the silkworm, it was excellent for an ornamental hedge. Of 1,000 miserably cared-for cuttings he raised on the old experimental farm 200 trees. The trees winter killed about half way down, and grew up again the next year. On the State fruit farm he had seen as fine a hedge of mulberries as he ever noticed in Southern Ohio from the Osage Orange. He thought we must begin with seedlings, as in other fruits; it would take time, but the promised results would justify the experiments. He urged the importance of its culture as the beginning of a new industry—silk culture; as a means of raising a valuable fruit; as a windbreak or hedge, and, finally, because it could be readily grown.

Mr. Emery supported the suggestion of Prof. Porter that we grow the mulberry from seed. This was the line of work for improvements in all our trees and fruits.

Mr. Bussee had grown them for two years. They started late in the spring, but had only winter killed down four or five inches.

Mr. Gideon. We have at our place at Excelsior two rows of the mulberry that make as solid and compact a hedge as the Osage Orange. It will feed two crops of silk worms. The fruit will be worth something by and by. We must improve it by seedling production. Our only hope is in seedlings—seedling mulberries as well as seedling apples. Must reject the poor, select the best; let the fittest survive. It can be developed, and is worthy of continued trial.

Mr. Emery. From seed it can be grown eighteen inches the first year.

Col. Stevens. Yes, six feet.

RASPBERRIES.

What is the best raspberry for general cultivation?

Mr. Golden. For a late variety, the Superb; for medium, the Philadelphia. Turner is good.

R. Porter. The Philadelphia for money.

Mr. Whipple. Have had eight crops of Philadelphia and no failures. The first year I hoe the ground clean; the second year mulch heavily with bagasse, and no cultivation is needed.

Mr. Sias preferred the Turner. It propagates rapidly and is hardy.

Mr. Harris. The old purple cane is a good berry for farmers. It is hardy and productive; but too small and soft for market. Would recommend the Cuthbert for its excellent quality.

Mr. Gould. I like the Philadelphia best for market and the Turner for my own use. My Philadelphias gave three quarts to the hill. The Turner covers up its fruit with the foliage.

Mr. Emery. The Cuthbert is the best late variety. The Philadelphia is the fruit for farmers.

C. L. Smith. But not so good for the gardener, as it does not carry well. Cuthbert will still look best after keeping two or three days, and as a shipping berry it is superior. The Turner was a

long continuous bearer. They will sometimes last for six weeks. Yet there was more money to the acre in the Philadelphia for home market than in any other. He would recommend to plant all three of these sorts for home market. He argued the importance of better culture of the raspberry, and heavy mulching with straw or bagasse if you have it.

Mr. Pearce. I looked over all the varieties three years ago, and Prof. Porter told me to see to the Cuthbert. I did so, and have not regretted it. Have seen berries on it in September.

BLACKBERRIES.

In a discussion on blackberries, Mr. Bussee related his experience and failure with Ancient Briton, which Mr. Pearce pronounced worthless for general cultivation.

Mr. Emery. Stone's Hardy has a low growing habit and is easily covered up. It needs no protection except in the severest winters.

GENERAL BUSINESS.

C. L. Smith was by resolution invited to prepare a paper for the next annual meeting on small fruit culture and roses.

Mr. Emery tendered his services to any local horticultural society, free of expense, to attend its meetings and impart instruction on any branch of fruit culture.

The sum of sixty dollars was voted to the Secretary for assistance in preparing the Annual Report for press, and in proof reading, to include the reporter's services at this meeting.

D. W. Humphrey, of Faribault, and M. Pearce, of Minneapolis, were made honorary life members, and Mrs. West, of Minneapolis, an honorary member for the year 1884.

FRUIT LISTS.

J. M. Underwood, A. W. Sias, and Wyman Elliot were appointed a committee to revise the fruit report for next annual meeting.

FINAL RESOLUTIONS.

The committee on Final Resolutions made the following report:
Mr. President and Fellow Members:

Your committee on Final Resolutions recommend the following:

Resolved, That the thanks of the Minnesota Horticultural Society are due to the Chicago, Milwaukee and St. Paul, the Chicago and Northwestern, the Minneapolis and St. Louis, and the St. Paul and Duluth Railroads, for rebates from regular passenger fare; to the daily newspapers for full and copious reports; to the students of the University for the sweet music rendered at our sessions; to the State University so ably represented in our meetings by the presence of Professors Folwell, Porter, Hall, and Winchell, for the accommodation of an audience room, and to the citizens of Minneapolis, who have so nobly responded to the call of our able committee on entertainment, in affording the members of the convention homes during their stay in the city; and in leaving Minneapolis, we carry with us to our homes lively recollections of generous treatment at their hands, and our best wishes for their continued health and prosperity.

S. M. EMERY,
JOHN. S. HARRIS,
G. W. FULLER,

Committee.

The report was unanimously adopted by a rising vote, and the Minneapolis and St. Paul papers requested to publish the resolutions.

Secretary Gibbs. Referring to that part of the Secretary's report, relative to courtesies extended by this society to the American Forestry Congress, I offer the following resolution:

Resolved, That the thanks of this society be tendered to the ladies of the Jewell Nursery for the magnificent collection of flowers presented by them to the American Forestry congress, in August last, with the compliments of the Minnesota Horticultural Society.

Resolution adopted unanimously.

AFTERNOON SESSION.

FORESTRY DAY.

Fourth Day, Friday, January 18th.

The subject of Forestry being first in order, the following resolutions were presented by the Secretary, and unanimously adopted without discussion.

THE TIMBER CULTURE ACT.

Resolved, by the Minnesota State Horticultural Society that the senators and representatives in congress from this State be requested to use their influence to prevent the repeal of the timber culture act, and to secure the passage of such amendments as will prevent abuses and promote its efficiency.

Resolved, That the thanks of the society be tendered to Hon. H. B. Strait, for his prompt action in this direction.

The following papers on forestry were accepted without reading, (the authors not being present), and were ordered printed.

THE TIMBER CULTURE ACT; SHOULD IT BE REPEALED?

BY FRANKLIN B. HOUGH, LOWVILLE, N. Y.

In considering this question, it will be proper to take notice of the origin and intentions of the law, the manner in which it has been executed or evaded, and the points of excellence or of fault

that it involves. From these data we may reasonably arrive at some conclusions as to its continuance, with or without amendments, or its entire repeal.

It is a matter of record, that the act under notice was introduced in Congress by the Hon. Mark H. Dunnell, of Minnesota, to whom also we are indebted for the laws under which investigations in forestry were first commenced in 1876.

It was the beginning of the conservative measures for the maintenance of our forests, the need of which must have convinced every thoughtful person who has noticed the rapid exhaustion of these resources, and the entire neglect of measures for their renewal. This waste and neglect, tend inevitably to want, and as this want approaches, the gradual advance in prices, gives unmistakable notice of its coming.

In its original form, as enacted March 3, 1873, this act offered 160 acres of land to any person who should plant 40 acres, and keep the plantation in healthy condition for ten years, the trees being not more than 12 feet apart each way. If the person failed to keep his plantation in good condition, or if he failed to cultivate and protect it, the land reverted to the government, subject to a new entry, and the investment was lost. There was a provision in favor of the homestead settler, and the entry was not to be liable for the previous debts of the planter. There was no requirement as to residence, nor was there any means provided for ascertaining a failure, during the ten years of probation, unless upon complaint of some contesting applicant.

In every untried experiment, difficulties are liable to arise which could not be foreseen, and a short experience brought to notice certain defects, which led to an amended act one year afterwards, the points of amendment being as follows:

The person making the entry, must be at least twenty one years of age, and a citizen of the United States, or if not, one who has declared his intention of becoming one. The time of proving up was reduced from ten to eight years. An amount less than a quarter section, if eighty or forty acres, might be entered, the requirement for planting being a fourth part of the land entered. No person could make more than one entry, unless fractional subdivisions were entered amounting in all to a quarter section.

It was now required that the land should be broken before planting, one-quarter of the land intended for woodland being broken the first year, another quarter the second year, and the remaining half the third year. One year after breaking the land was to be

planted as before, and after that nothing more was specified as a requirement, beyond protection, until the time of proving, eight years after entry.

In case of death, an heir might succeed to the benefits of the whole, or a part, accordingly as they were found entitled.

The principal fault in both of these acts, was in allowing the trees to be set too widely apart. The rule might work in a climate like that of New England, where almost any kind of a tree set in such soil as we find on the prairies, would grow to meet its neighbor half way, if the distance was twelve feet or even more; but upon the western plains and prairies, although the soil may be fertile, the air is dry. The climate is subject to greater vicissitudes, and with the drying winds and the droughts that are very liable to occur, the young tree, if set with roots, and with the very best of care and cultivation, has little chance of growing to much height, if at liberty to spread low, and with some species it would be doubtful if it grew at all.

This defect in the law was remedied by a third law, passed June 14, 1878, which is with slight amendment still in force. It reduced the interval between the trees to four feet, and the area to be planted from one-fourth to one-sixteenth of the whole amount entered. If the entry be a full quarter-section, five acres must be plowed the first year, and five acres the second. In the second year the first five acres must be cultivated with a crop or otherwise. In the third year, the first five acres must be planted with trees, tree-seeds or cuttings, and the second five acres must be cultivated. In the fourth year, the land last broken must be planted, and after this the whole must be protected until the time of proving for title, eight years after entry.

Such is in substance the law in its present form, the merits or defects of which we are now to consider. It may be said in general, that if faithfully and conscientiously done, according to the requirements of the law, and with the careful cultivation after planting which every owner should give his land, to secure the very best result, we might reasonably expect to see a thrifty young grove at the end of the eight years, whenever trees can be cultivated without irrigation in any part of the country.

But it is a well known fact, that this careful attention cannot always be given. In many cases the planter has not the experience needed for successful management; or he is liable to commit errors, by depending upon an experience gained under widely different conditions and which must fail him altogether in his new

enterprise. Between this neglect of some, the mistakes of others, we would naturally expect to find many tree-claims below the standard of excellence due to good management, at the time of claiming title, and some that should be rejected as failures.

I consider the present law chiefly defective in its failing to require, *that land once entered for tree-culture should thereafter be subject to no other form of entry.* It has been a practice very prevalent in some land districts, for persons to enter timber-culture claims who did not intend to plant a tree. If located in a region that was filling up with settlers, they might reasonably expect, before the time for planting, to find some person who would be willing to pay them one, two or three hundred dollars to abandon the claim, when the purchaser would stand ready to enter it as a homestead, or to purchase it at the government price.

This custom has been practiced upon thousands of occasions, and the country has lost the benefits that should have resulted from the plantations. In other instances entries have been made, to acquire temporary possession for pasturage, or in anticipation of the location of a line of railroad, or of a town site. The adventurer in these cases, only risked his chances for a year or two by the payment of the office fees, and might strike a success. If he failed to sell, only these fees would be lost, and he might go elsewhere and do likewise.

Of course, no law could be framed, that would compel a man to do what he was not able to accomplish, nor would it be just to deny him the privilege of selling his improvement, and his opportunity to enter another, or to deny the purchaser the benefits of his purchase. But it is certainly quite within the power of congress, and I regard it as their duty, to enact, that land once entered for timber culture, shall be held thereafter by no other title;—and furthermore to enact, that this proportion of woodland shall be maintained upon the land there ever after, as a condition of the title. It need not be the identical area first planted, but I would have at least one sixteenth part of the quarter-section always after in woodland, under penalty of forfeiture of the title. Should such requirement ever be enacted, it should of course provide for unavoidable losses, as in case of fires, where a reasonable time should be allowed for re-planting, and for exceptional cases, where it might be inexpedient or improper to insist upon the maintenance, as where a village or a town might spring up upon the land.

I regard the present law as also defective, in its not providing any certain means for ascertaining at the several land offices, and

through these at the general land office, the facts as they are, concerning the execution of the law, from year to year. It would be no hardship for the holders of these claims to be required to report annually to the register of his land district, the amount of land broken and cultivated, and planted with trees, at the end of each year. The blanks for this purpose might be issued with the certificate of first entry, or might be sent through the mails as they were needed for use. They should be properly certified, and false reports might be punished by forfeiture of title. With such reports properly consolidated, we would be able to know definitely, what we can now only guess at, as to whether the timber culture act is destined to be as successful as its friends desire, or whether in certain regions, it has afforded only an opportunity for speculation and fraud.

Firmly believing as I do, that the agricultural welfare of the whole country would be increased and sustained, if a portion of the area was somewhat evenly interspersed with groves and belts of trees, and kept in due proportion to the cultivated surface, I would deem it proper to enact a law in the future conveyance of new lands by the government under any form of title, to insert a clause requiring that within a certain reasonable period, a given amount of land, if prairie, should be planted, or that if now woodland, that a certain portion should be reserved, and continued thereafter in some form of tree growth. Exceptions should of course be made to this rule in regions where it would be impracticable, and some might regard such a law as arbitrary and oppressive.

It may not be possible to secure such an enactment, but it is within the power of every owner of land to prove upon his own premises, the benefits of such plantations, and it is to be earnestly hoped that examples will multiply until these benefits are widely enjoyed.

THE STUDY OF FORESTRY AS AN IMPORTANT CONTRIBUTOR TO PRACTICAL EDUCATION.

[Read at the St. Paul meeting of the American Forestry Congress, August 8, 1883, and copy kindly furnished by the author.]

BY HON. H. G. JOLY, OF QUEBEC, CANADA.

There is a danger, in treating this subject, that of exaggeration which will damage the best cause.

The fact that we have met here from such widely distant sections of North America, that many of us, leaving our homes and occupations, have traveled hundreds and hundreds of miles, to attend this Forestry Congress, is a strong guarantee that every effort made to raise in public estimation, the study and practice of Forestry, will meet with your hearty support; but I wish to appeal to your reason, rather than to your sympathy, and to satisfy the judgment of the thoughtful men who are ready and willing to join every earnest effort if they can once see that its results will be beneficial to mankind.

What is meant by *practical education*? Training the child, his body, his mind and his heart for the work of life. It is a general preparation for it. When you begin the education of the child, you do not know what his future occupation in life will be. A good education is like a solid foundation, built on the rock, ready to receive and support, with safety, any kind of superstructure that may be erected upon it.

Education is Training. There is mental gymnastic to train the mind, as well as corporal gymnastic to train the body. A man is not often called upon in after life, to repeat the performances learnt, as a boy, at the gymnasium; he may even forget them, for want of practice, but he will preserve through life some of the strength and activity thereby acquired.

The aim of practical education or training ought to be as much as possible, to choose for the training of children such exercises as will be directly applicable and useful in after life, and I think the study of forestry fulfills these conditions, to a great degree.

Timber is in request more or less, all over the world. The Esquimaux is about the only man who dispenses with it, not from

choice, but because he cannot get it; his winter residence is built with blocks of ice, and he braves the angry waves of the North Seas in a leather canoe ribbed with the bones of whales. Everywhere else you will find wood, sometimes only the palm tree, or even the bamboo, but everywhere, in the wildest as in the most civilized countries, you will find wood in daily use.

Where the natural growth of timber is abundant, the people will waste it if they are not brought up with a due consideration of its value. As a Canadian I can speak with some experience on that point. In such countries, people ought to be taught the value of timber, which trees to cut, which to preserve, how to thin their forests with judgment, so as to increase their value, while deriving a good revenue from them.

On the other side where the timber is scarce or where there is none, like in the western pariries, people must be taught how to grow it. They must learn what kinds of trees are best adapted to their soil, their climate and their wants, and how to grow them.

It is wonderful how little the country people in general, know about forest trees. Let them begin to learn when they are young, the best mode of instructing the children; this is the surest way of reaching the people at large.

You will say: "You are speaking of a general system of education; remember that what you propose will only apply to the country, and not to the cities." By far the great majority of the human race live in the country, and those who are condemned to live in the cities, generally look forward, as a happy deliverance and reward for their labors, to the time when they will leave town and live in the country. Take the most devoted townsman and ask him if the forest trees are not the finest ornament of his streets. But let that distinction stand as between country people and city people, if you like. I will now attempt to show that the proposition enunciated in the title of this paper applies to both cases, and that the study of the elements of forestry can be made an important contributor to practical education.

How can you teach a child a better lesson of foresight, observation, patience, care for the smallest details and perseverance, than in teaching him to plant a tree. He will soon learn that he can only transplant his tree, with hope of success, in certain seasons; that if he does not take it up with care, carry it with care, replant it with care, it will not grow. He will soon find out that, by weeding and cultivating the ground carefully, staking his tree, pruning it judiciously, it will prosper.

Speak of the training of young trees? Has not that very example of the careful training of a young and tender tree, been taken, in all ages, in all countries, as the best example for the education of childhood?

There are not many schools, even in the cities, where children could not be taught to plant, every year, and attend to at least one tree, each. If there is no room on the school grounds, there is room along the streets, the roads, the squares, the uncultivated hills, stony patches, waste grounds in the neighborhood of cities, where trees would always be welcomed. The fact is, that in several schools the practice has been already introduced, in observation of *Arbor Day*.

It is good work for the *body* and the *mind*, and I do not fear to say for the *heart* too.

What a lesson you could teach a child, when he asks: "How long will it take before that tree I am now planting is big enough to cut down?" If you answer, "It may take twenty, thirty, forty years, or more; that is a terrible long time to wait is it not?" "You may die before your tree is big, or go so far away that you will never see it again; but your work will not be lost, my child; if you do not profit by it others will, and you will have done more than many a grown up man has done—you will have left something useful behind you."

ADAPTATIONS AND METHODS OF CULTURE IN FORESTRY.

BY HON. GEO. H. WRIGHT, OF SIOUX CITY, IOWA.

When we attempt to discuss the question of forest tree planting, whether it be on our prairies for shelter belts, for groves to shelter our homes and stock from winter storms or summer heat, or whether it be as a financial investment or to fulfill the Government timber culture law, the main question that presents itself to our mind is adaptability.

We should consider the locality where the trees are to be grown latitude and longitude, altitude and rainfall; the particular time of year when we get the greatest amount of rain, is it distributed

through the year or is spring the season of the greatest amount of precipitation?—the soil and the general depth below the surface where water is found. All the above points have more or less bearing on the successful growing of forest trees.

The state of Minnesota is eminently a timber growing state. The soil is dry, yet water is found near the surface. These are two important factors in tree growing. The snows of winter act as mulch to the roots, and afford moisture for spring growth.

The varieties and species of trees that may be successfully grown in Minnesota, are almost limitless. The valuable conifers are found here in native forest; also the oak, maples, walnuts, elms, lindens, birch, cottonwood, and many varieties of the poplars, with other species more or less valuable. With these evidences before us showing what nature has done, we have the ground work and information for the acts of man.

Right here comes in the question for the settler, farmer, speculator and financier, can these or any of them grow trees without previous training in the school of forestry and horticulture?

Answer, yes.

Any man who can prepare the ground for the growing of a good crop of corn, can with equal care and labor grow trees.

Prepare the ground by thorough cultivation, for at least two years from breaking, before planting trees. First break the prairie in June, turn all the sod under; "do not cut and cover," but do the work well. In October, backset or cross the breaking three inches deeper than the original breaking. Crop with wheat, oats or flax the following year. After the crop has been removed, plow the ground at least seven inches deep, harrow thoroughly and if white or black walnuts are to be planted, mark the ground as for corn, four feet each way, and plant them in the fall, planting the nut with the shuck on, in the corners where the lines cross. Step on the nut after it is dropped in place. After all the planting has been done, harrow and roll the entire field.

If young conifers, larch or deciduous trees are to be planted, defer your marking until the following spring, when the ground should be marked as above described, and if to be planted in conifers, secure nursery grown, once transplanted, three year old trees, but if deciduous trees are to be planted, get strictly first-class one year old trees, and plant where the lines cross.

I have found after twenty years' experience that the best and cheapest way to plant is with a nursery spade. Place the spade point in the corner where the lines cross, hold the handle perpen-

dicular, place the foot on the spade, pressing it into the ground the full length, then shove the top of the handle from you and at the same time turning the spade so as to open the hole as much as possible; here have the second man with the trees ready to place one tree in the hole the proper depth; hold onto it and press the earth firmly against and around the tree.

At this particular place allow me to call the attention of the planter to the importance of pressing the soil solid around the trees, so that it will exclude all openings about the roots.

Two good laborers can easily plant from two to three acres per day. In the handling of the trees from the time they are taken from the nursery where the seeds were grown to the place where permanently planted, great care should be exercised in preventing the roots of the trees from exposure to sun and wind. Remember that the roots grow in the ground and not in the air; this caution has so often been repeated, that it is an old story to the practical horticulturist, but we must remember that our vast prairies are being settled by a class of young eastern men, who have not had this matter impressed on their minds.

The question of what shall we plant must be determined by the planter himself—what are your circumstances financial and otherwise, are you a new farmer opening up a farm on the open prairie, and want shelter-belts, fuel and shade; then plant cotton-wood, white poplar, and box elder. These trees will make wood rapidly and will grow readily in comparatively new soil. If in an older country, on farms in Minnesota, pines will be valuable. For black-walnut, a deep rich alluvial soil will pay thirty per cent. on the investment in ten to twenty years. Plant our western white ash on any dry, rich prairie soil in Minnesota and east half of Dakota. European larch if properly handled will give rich returns for the investment if planted in Minnesota or the Red River Valley of the north, in Dakota.

The box elder (ash leaf maple) will flourish in a drier climate than any other American tree.

The white or English gray willow when grown as a tree is valuable as a timber tree for building purposes, and when seasoned, will stand for years as a fence post.

Few persons are aware of the value of box elder for fence posts. Cut in winter, pile up clear of ground and season for eighteen months, and then set in the ground. As a fence post they will last equal to western oak.

I advise planting all forest trees on the prairie about four feet apart each way. This to many may seem too close, but my experience justifies the statement. Close planting will make long bodied trees. Grow this way from seven to ten years; at the expiration of this time the planter can commence to cut out fence posts, poles, &c. The cost of growing ten acres of forest trees on the prairie, by a farmer residing on his land, will vary from ten to fifteen dollars per acre, for a period of five years. After that date there is no expense except keeping out fires. And the value of 2000 to 2500 trees per acre, ten years of age, in a prairie country, depending on the varieties and species grown, will be from twenty-five to seventy-five dollars per acre, and an additional value of comfort and appearance that cannot be computed.

SIoux CITY, IOWA, Jan 7th, 1884.

TREES FOR THE HIGHWAY.

LETTER FROM DR. HOUGH.

LOWVILLE, N. Y., January 5th, 1884.

Oliver Gibbs, Jr.,

DEAR SIR:—

* * * * *

There is one thing that I will venture to urge upon the attention of the meeting, and through the combined influence of the Horticultural and Forestry Associations, there would be reason to hope that proper legislation might be secured. Although a year must elapse before another session, there is all the more time allowed for ample preparation.

I refer to a law *requiring* the local authorities having charge of the public highways, to cause plantations to be made along their borders. It might not at first be expedient to enforce such a law, excepting in the prairie regions of the state, but there it should not be left optional, unless a dissent were expressed by a large majority in the local elections. Upon the continent in Europe, and especially in Germany and France, where the roads are as a general rule without fences, they are seldom without their avenues of trees. The sameness in kind, and uniformity in spacing, indicates that they

owe their existence to no caprice of their owners, but to the supervision of some authority of law, that directed their planting, and that protects them from harm. In Germany, these trees are often apple trees, and their fruit which is sold annually at auction upon the trees, goes toward paying for the expenses of these highways. In northern Italy such plantations are often of the mulberry, and the foliage is fed to silk worms. In some districts the tops on the side branches are allowed to be taken off for fuel, and in all of them the old and decaying trees are taken out before they have ceased to be of value for the wood, and their places are supplied by other trees.

I need not urge the importance of plantations of this kind in a treeless region like the western part of your state. Aside from the protection which they would afford as wind-breaks, they would serve to mark the route of the road, when the country is covered with deep snows in winter, or to those obliged to travel by night at any season of the year. They would encourage the increase of insectivorous birds, by affording them shelter, and above all they would impart an amenity and beauty to the country that could not fail to render it more agreeable for residence. To those who can hear no other word, it may be said, that it would make their farms worth more *money*.

In suggesting this legislation, it need not be assumed that it will prove burdensome. The planting might be limited to a certain number every year, so that the work would extend, say through ten or a dozen years. It would be just to charge the expenses upon the property of the towns, in the same manner as highway taxes, and those owning land along a highway should be allowed to do their own planting, subject to such general rules as might be prescribed by law, and to the acceptance of the authorities having the highways in charge. If these owners failed to plant, the work should be done at their expense. There will always be some, who having no land along a highway, would be required to pay their tree-tax in money, and thus the means would be at hand for paying the expenses, and the money raised would all be expended near home.

Such plantations would be failures, without adequate means for their protection from the injury that might happen from cattle, or from fires and casualties, and proper penalties should be enacted against wilful injury, or improper neglect.

In cities and villages, it is now an accepted rule, that all the trees upon any street should be of the same kind. There may be a diversity upon different streets, and a certain degree of grouping

and combination upon public parks, cemeteries, and the like, but the effect is always heightened when the trees upon a street or avenue, are all of a kind, and as nearly as may be, all of a size. This rule would equally apply to country roads ; but from a diversity of soil and conditions, it might not always be best, and we are left to the guidance of the rule that applies everywhere, viz :—*to plant the kinds that thrive best.*

Very truly yours,

FRANKLIN B. HOUGH.

RESOLUTION ON PREMIUMS.

G. W. Fuller offered the following resolution :

Resolved, That in offering premiums for fruits no premiums be offered for any named varieties not recommended by this Society for cultivation in this state.

The Secretary. That resolution, if adopted in its present form, would destroy our exhibitions. We are raising a great many varieties of fruit in this state; many of them are promising, but are kept on the experimental list, and we are recommending only such as have been generally tried for a long term of years. Our premium lists, as at present made up, encourage growers to exhibit these experimental sorts, by giving premiums to such as are attractive and promising. We are not paying any more premiums than are necessary to bring out a fair display of what our people are doing in fruit raising.

I know that sometimes we have paid premiums on varieties not generally thought hardy in all parts of the state, but not on any but what are profitably grown in some parts of it, unless in cases where there were some special good reasons for it, or by inadvertence. There are a good many things to be considered in getting out a premium list and an exhibit of fruits, which are overlooked in such a resolution as this. I will mention a few. Last year we had no winter fruit in the state to show, that amounted to anything. Just across the state line, fairly in our fruit belt, in the orchard of A. J. Phillips of West Salem, Wisconsin, I ascertained that there was a lot of very handsome winter apples, of varieties

quite interesting to this society, and just being introduced, but not fruiting as yet in Minnesota. They were on a very elevated site, and were a fine study in color and quality as illustrating the value of high lands for raising apples. I wanted an essay from Mr. Phillips. I wanted to get out his fruit for our members to look at and study. I wanted Mr. Phillips to attend the meeting; and so I sent him an invitation to write the essay, and we got up a premium list that invited his apples by their names. He came. He displayed his fruit. It was about all we had on our tables. It was a lovely exhibition, as you well remember. He gave us his experience in fruit raising in an interesting paper, and did us lots of good in the part he took in our discussions. He contributed one of the seven prize essays on orcharding; one of the best if not the best. He did not get the prize on the essay, but he carried off our premiums on apples, and he felt good. He had earned them. This is one instance. This resolution would have cut that scheme all up. Now another: Everybody who is looking for new and nice varieties wants to see the Wolf River apple, the Northwestern Greening, the McMahon White, the Russian Anis, the Antonovka, the Hibernial, the Little Seedling, the Bogdanoff, the Longfield, the Yellow Transparent, the Forster Sweet, the Forster Red Winter, the Giant Swaar, etc., etc. None of them are recommended by the Society at present. This resolution would not permit a premium to be offered for somebody to bring them out. In my searches for facts of interest, I am continually finding fruits that I want the grower to contribute for exhibition; when I can say to the grower, our committee may think it worthy of a premium, and if any is awarded you shall have it, I feel at liberty to ask for the fruit, and I always get it. Four-fifths of the apples on the tables here this winter I have gathered up and brought here in this way. Now here is another case. Over there on the table is a plate of grey gilliflower apples, which I have entered in the name of Geo. P. Pepper; another of Pewaukee, by the same. Both of them are there to illustrate a law of reproduction and variation from seed, the law laid down in Mr. Pepper's essays before this society, which I have explained to many, using these plates of fruit as an object lesson. I picked the fruit off the Green Bay tables, and asked Mr. Pepper to let me bring it here. You that know that the grey gilliflowers on that plate are from the very tree that Mr. Pepper raised from the seed of the isolated grey gilliflower tree described by him on page one hundred and twenty-five of our report of 1883, and you that never have seen the Pewaukee before but have heard of it, know its parentage and

wish to study the lesson it imparts, surely will not begrudge Mr. Peffer his premium.

In this experimental stage of our fruit raising, when we have so much to learn, it will not do to have cast-iron rules about premiums. You must leave some discretion to the secretary and executive committee in lists and programs; then, if you appoint a competent set of judges on your exhibits, such as we always have had, there will not be much to complain of.

Mr. Pearce opposed the resolution. He thought if a man produced fine fruit he should be rewarded for it. We do not all agree as to what should be recommended. The majority vote is what recommends. It may not be right at all times. I can grow varieties that I cannot get recommended by the majority. If we say we will pay no premiums on a variety till the majority recommend it, the minority have no fair show. I say at present it is desirable to invite for exhibition all good fruit grown in the State.

Mr. Plumb. As a general rule, it is safe to leave it to your judges to decide whether a variety offered is worthy of a premium.

Col. Stevens, President Smith, Mr. Gideon and others opposed the resolution, and it was rejected.

THE McMAHON WHITE APPLE.

Mr. Plumb. I have found on your table here a fine plate of the McMahon White apple. It is a very interesting variety. Can any one present tell us how it is doing in Minnesota?

Mr. Taylor. It is a hardy, medium variety, bearing fairly and keeping all winter. We consider it peculiarly well adapted to top grafting on the Duchess.

[See close of this day's proceedings for letter from Mr. Taylor.]

DISCUSSION ON GRAPES.

Col. Stevens. Some of our members have expressed a wish that we have a discussion on grapes. I would like to hear from Mr. Norquist of Red Wing, on this subject, as he is a large grower and one of the most skillful and successful in the State.

Mr. Norquist. I have been cultivating grapes for fifteen years. Have Concord, Delaware, Worden, Janesville, and about sixteen

other varieties. Janesville is the earliest. Moore's Early and Agawam are good.

President Smith. Moore's Early is a delicious grape, yields almost as well as Concord, but lacks vigor. Janesville will always ripen before the frost, but it does not sell well in market. I have raised 9000 pounds on two acres. My main reliance is on Concord and Delaware, but find the Agawam and Worden good varieties. My rows are eight by eight feet and vines trained on trellises. Grapes will not bear and ripen unless the weeds are kept down. Perfectly clean culture is what pays in grapes.

I have lost only three crops in twenty-five years—once from hail and twice from frost—not total, but partial losses. The last year was the worst. Sold \$418 worth then, and lost probably \$500 worth. I usually dress my grape ground twice a year with wood ashes and land plaster; once in the spring, and again just before the fruit ripens. Only the best varieties pay, and the fruit of these must be well selected and prepared for market. I sell only the best bunches; can get more for these than for the good and poor mixed. The old Oporto is the only variety that it is safe to leave on the trellises over winter. The Lady he believed would be one of the best of the white grapes. Conditions varied so much it was hard to generalize, but taking all situations and the years as they run, Concord pays as well at 10 cents a pound as Delaware at 20 cents. Have been often deceived and put to loss and trouble by having grape vines sent me that were not true to name. Latterly I am careful to buy only of parties who know what they are selling.

Mr. Gideon. On my ground the Eumelan yields twice as much as the Concord, and is the best in quality. Complaint had been made that it was subject to mildew, but have not seen much of it. Iona also does well at Minnetonka, has nice bunches, and we can ripen it. Brighton has the finest bunches, and has good bearing qualities. It is rather earlier than Eumelan. Worden yields well and is early.

Mr. Sias. In our part of the State the Eumelan fails from mildew.

Mr. Harris. It is worthless with us for the same reason. My grape crop this year sold for \$300; would have been \$600 but for the September frost, and \$1000 but for destructive rains. Moore's Early was the first to ripen. Janesville is inferior in quality to Concord, but is two weeks earlier, and has more money in it. For profit he would name—1st. Janesville; 2d. Moore's Early; 3d. Worden; 4th. Concord.

BLACKBERRIES AGAIN.

Col. Stevens. There was once an abundance of wild blackberries in Carver county. What is the cause of their disappearance? Will Mr. Ludluff or Mr. Peterson answer?

Mr. Ludluff. We have them yet in the fence corners, inside of the fields. They are destroyed by stock on the ranges elsewhere.

Mr. Peterson. Another cause of their disappearance is the want of shelter, since the underbrush has been removed.

GRAPES RESUMED.

Mr. Bussee. I think we ought to take more time to discuss grapes and strawberries.

Mr. Plumb. Before we can decide intelligently as to what varieties of grapes to plant we must study their special adaptations. Varieties subject to mildew will only grow adjacent to bodies of water. We ought to have committees of observation on these points of adaptation. Away from bodies of water, plant Concord first, because least subject to mildew; then Worden, and next, Delaware. The cause of mildew was the shock to a tender leaf system by a warm day followed by a cold night. The Concord has a thick, leathery leaf that resists the influence of these sudden changes of temperature. Mr. Plumb was not in favor of mulching grapes. The ground must be kept hot for the best growth and ripening of the grape.

Mr. Pearce. As to the ripening, it makes a great difference how the rows are arranged. If the rows ran east and west the grape will ripen two weeks earlier than when they run north and south. He plants his vines on the south side, one foot from the trellis. This he considers best, after twenty years' experience.

President Smith got his best and earliest grapes from east and west rows.

Mr. Pearce. Charles Gibson, at Lake Minnetonka, has the finest grapes I ever saw. His vineyard is in a narrow clearing in the Minnetonka woods, on a hillside facing west. At first the ground was not rich enough. I advised him to save his forest leaves, make a compost of them and dress his vineyard. That doubled the size of his grapes, and they all ripened. He had Dela-

wares, Concords, Ionas and Janesvilles. They were the finest I ever saw anywhere.

Gen. W. G. Le Duc. On which side of the lake is this vineyard?

Mr. Pearce. The east side sloping to the west, and the rows all east and west.

Gen. Le Duc. How wide is the lake opposite the vineyard?

Mr. Pearce. About four miles; timber land east and back of the vineyard.

Gen. Le Duc. You can feel the descent of moisture inland, four to fifteen miles, sometimes fifty.

Col. Stevens thought the influence of moisture was overrated. Where is the water in Scott county? What water is near Mr. Grimes?

Mr. Pearce. The best grapes in the state are always to be found near bodies of water, either on our lakes or rivers. You will find this true every time.

Mr. Plumb. Water does it. For every mile of difference in distance from water, you may reckon ten degrees in temperature. This has been tested and proved. Ten degrees higher in day time, ten lower at night. This makes all the difference between success and failure in many seasons. The equalization in temperature is what is needed. Deep cultivation might remedy the defect of location in part, but not fully.

Gen. Le Duc. Would any of you advise the planting of a vineyard on a steep northeast slope near a stream of water, limestone soil, previously timbered?

Mr. Golden instanced a vineyard so situated that was successful.

Mr. Gideon. The most unnatural exposure for grapes.

Mr. Harris has seen many wild grape vines on northeast slopes, but does not know that they bear.

Prof. Porter. Experience is against a northeast exposure, but if I had no other, I would plant there.

The Secretary. In connection with this discussion, I will print here the report of Mr. Ludluff.

REPORT ON GRAPES TESTED IN CARVER COUNTY.

BY CHARLES LUDLUFF, OF CARVER, MINN.

We read in the Bible that Noah, after the flood, began to be a husbandman, and he planted a vineyard. This is supposed to have been at the foot of Mount Ararat, which travelers tell us is situated at about 40° north latitude and 62° east longitude. This ancient time, 4,000 years ago, and this locality, we take to be the origin of grape culture, and from then and there it has spread over the whole earth. We, in Minnesota, are from three to seven degrees farther north, where not every kind of grapes will grow; but as wherever the wild American apple, *Pyrus Malus Sylvestris*, is found, a better apple can be made to thrive, so in all regions where the Fox grape, *Vitis Lubrusca*, is at home, there a better product of grapes can be cultivated with success. Every climate has its kind that can be grown there, but we can only find it out by trial and observation; and as for several years I have carried on experiments to advance the culture of the grape in Minnesota, I present the State Horticultural Society my notes on different varieties, for such use as they may please to make with them, all based upon plantings and fruitings of my own :

Allen Hybrid—Has not done well here ; discarded.

Atvey—Poor for us ; discarded.

Agawam—Rogers' Hybrid No. 15 ; takes after Concord ; discarded.

Aminia—Sweet ; fine flavor for table and market.

Autochan—Arnold's No. 5, poor grower ; discarded.

Black Hawk—Ripens with Concord ; discarded.

Beauty of Minnesota—Good flavor ; the best grape for Minnesota.

Blood's Black—Foxy ; discarded.

Barry—Roger's Hybrid No. 43 ; productive, early ; sweet.

Brighton—Ripens early ; flesh tender, sweet, juicy, slightly aromatic, pleasant flavor.

Belvidere—Like Hartford ; discarded.

Brand—Arnold's No. 8 ; poor grower ; discarded.

Concord Chasselas—Poor grower ; discarded.

Canada—Arnold's No. 16 ; poor here ; discarded.

Catawba—Ripens too late ; discarded.

Cassidy—Too late ; discarded.

Challenge—Did poorly on my place; discarded.

Cambridge—Ripens a few days before Concord; hardy; better than Concord.

Concord, Muscat—Same as C. Chasselas; discarded.

Croton—Poor grower; discarded.

Canby's August—Very poor; discarded.

Clinton—Too poor in quality for me; discarded.

Concord—If the Concord was eight days earlier, then it would be one of the best for us; but in some seasons it does not get fully ripe.*

Conquerer—Does poorly here; discarded.

Cornucopia—Arnold's No. 2; worthless here; discarded.

Creveling—Ripens before Concord; juicy and sweet; last season it got the leaf blight on my place.

Cottage—Early; ripens before Concord, and is better.

Duchess—New; not tested yet; should be one of the best.

Delaware—Bunch medium, compact; pulp sweet, tender and juicy; productive and profitable.

Dracut Amber—Too foxy for my taste; discarded.

Diana—Ripens too late; discarded.

Elvira—Too late; discarded.

Essex—Mildewed; discarded.

Early Dawn—New; not tested yet.

Eva—Similar to Martha.

Early Victor—Similar to Martha; not tested yet.

Eldorado—Similar to Martha; not tested yet; called a fine grape.

Eumelan—For table grape this should be planted in every garden.

Guertner—Poor grower; discarded.

Green's No. 2.—Bunch large; tender, sweet; fine quality.

Green's No. 7.—An extra early vigorous grower; comes near even with Delaware.

Humboldt.—Too late for us; discarded.

Hartford Prolific—Very early; otherwise not valuable.

Berbert—Roger's Hybrid No. 44; worthless; discarded.

Isvaella—Did poorly on my place; discarded.

Iona—Late in ripening; discarded.

Isabella—Too late; discarded.

Ire's Seedlings—Too late; discarded.

Janesville—Hardy, healthy, productive; quality like Hartford; valuable for its earliness.

Lindley—Flesh tender, sweet, aromatic; a table grape.

Lady—Early; of the best quality.

Logan—Too poor; discarded.

Mascatawny—Too late; discarded.

Massasoit—Roger's Hybrid No. 3, early; flesh tender, sweet; this is a very profitable grape.

Mary Ann—Foxy; discarded.

Martha—A little foxy; flesh tender and sweet; earlier than Concord.

Merrimac—Roger's Hybrid No. 19; good when it gets ripe; discarded.

*NOTE BY THE SECRETARY. Mr. Ludluff's soil and location is not favorable to the early ripening of the grape, though his latitude is below 45°

Miles.—Very early; flesh tender and pleasant.

Minnesota Mammoth.—The name is too good for it; a poor grape; discarded.

North Carolina.—Poor quality; discarded.

New Haven.—A seedling from Concord; early; good quality.

Northern Muscadine.—Foxy; berries drop from the bunch when ripe; discarded.

Othello.—Arnold's No. 1; all of the Arnold's Hybrids are poor with me; discarded.

Pocklington.—New; should be one of the best.

Roger's Hybrid No. 5.—One of the finest, but a little too late.

Roger's No. 33.—Berries very long; good quality.

Roger's No. 30.—Same as No. 33.

Rebecca.—Poor here; discarded.

Rochester.—Early, sweet; fine flavor.

Salem, Roger's No. 53.—Poor on my place, discarded.

Senesqua.—Too late; discarded.

Talman or Champion.—Good for earliest; it is earlier than Hartford.

Telegraph.—bunch medium; very compact; flesh juicy; the best of all early kinds.

Underhill's Seedling.—Foxy; discarded.

Venango, or Miner Seedling.—Foxy; discarded.

Vergennes.—New, not tested; expected to be a first class grape.

Wilder, Roger's Hybrid No. 4.—Hardy, healthy and productive.

Whitehall.—Early; bunch compact; berries tender, sweet.

Worden.—bunch large; shouldered; berries large; flesh sweet; good quality.

Wamington Red.—Mildews; discarded.

Walter.—Not successful here; discarded.

All in this list not marked discarded, I have now growing, most of them experimentally, and of such there may be some that will develop weak points and have to be discarded at last. I think it will prove true that only those varieties that ripen earlier than the Concord will be found profitable for general cultivation in Minnesota.

DISCUSSION ON STRAWBERRIES.

Mr. Catler, of Sumter. I would like the opinion of members as to several of our newer varieties. How about the Glendale?

C. L. Smith. I like this variety for a market berry. It is very large and firm; have known 27 of them to fill a quart box; fruit stems large and very large hull; hence they bear handling and carriage. Will keep in good condition four or five days, after being picked; then you can turn them upside down and they will be as good as new. They sell well.

President Smith said the Glendales were larger than the Sharpless on the average, and he also found them excellent for shipping.

Mr. Bussee complained that they would not ripen at the tip of the berry.

Secretary Gibbs. I like the Glendale, but unless it has deep cultivation or plenty of water, the foliage is liable to sunburn. It evaporates moisture in great quantities, which must be supplied or it will not do well. Its foliage is very rank when well grown, and fruit large accordingly.

Mr. Sias. They are too tart.

Mr. Pearce. It gives the best satisfaction of any berry with me. It should be well mulched. It is very late—a most desirable quality and excellent for canning. It also has abundant pollen, and is a good fertilizer for the Crescent. Set in alternate rows with Crescent.

Secretary Gibbs. As to color of the strawberry, its firmness or softness, its texture, its continuous bearing throughout the season, and even as to its quality, we are forever at sea, and contradicting ourselves and each other, unless we state every time whether a berry is growing alone or in company with some other, and if in company, what its adjacent varieties are. I am satisfied that we not only make the pistillates bear by fertilizing with pollen of the staminate, as everybody knows to be the case, but that there is an immediate influence upon the pulp of the berry, and not only from staminate to pistillate, but from staminate to staminate. I will not take time to state the facts here, but will try to get some of them in shape for our Annual Report; and I ask you all to watch your strawberry plants and see what conclusions you come to. I think you will find in this suggestion a solution of some of our most puzzling things about the strawberry, and discover a remedy for the deficiencies of some of the sorts we so regretfully fail with now.

On motion of Secretary Gibbs, a vote of thanks was tendered to J. C. Plumb, of Milton, Wisconsin, for his valuable services at this meeting.

Prof. Porter, on behalf of the University of Minnesota, thanked the society for meeting in their rooms, and on his motion, the society then adjourned to meet in June next, at the call of the executive committee.

NOTE BY THE SECRETARY.

In copying out the notes of the foregoing discussions, which were not taken verbatim by the reporter, but in a condensed form, the Secretary has been obliged in many instances of doubt as to the fact or thought presented, to choose between striking out entirely or taking the chance of a possible misrepresentation. He has chosen the former as preferable in almost if not quite every case. If we are ever to have a thoroughly accurate and satisfactory report of our discussions, it now seems clear, after many years' trial of the abstract system, that we must employ a stenographer of experience, and take down everything verbatim—not to publish all—that would be impossible, but to have what the editor does select from each speaker as nearly correct as possible. Much of our very best matter has been lost every year under the abstract system.

RESOLUTIONS ADOPTED.

By J. T. Grimes :

Resolved, That an art gallery be established without expense to this society, to be known as the Art Gallery of the Minnesota Horticultural Society, to include the likenesses of members who have been made life members of this society, and the Secretary be instructed to notify such members of this action, or their representatives if deceased, and request portraits for the same.

By S. M. Emery :

Resolved, That our secretary be instructed to obtain from Prof. S. H. Folsom a paper on "Tree Culture, its Bearing upon Atmospheric Changes, Climate and Rainfall," for our next annual meeting.

PREMIUMS AWARDED AND PAID.

On fruits.....	\$80 00
On vegetables	7 00
On pantry stores, etc.....	9 00
On seeds.....	6 00
On works of art.....	10 00
Total	\$112 00

BILLS ALLOWED AND ORDERS DRAWN.

Secretary's office expenses to Jan. 5, 1884.....	\$69 96
President's expense bill, year 1883	50 00
Librarian, salary year 1883.....	10 00
Repairs in library.....	15 00
Library expenses, express charges.....	3 05
J. T. Grimes, expense acc't, former years.....	81 00
Postage on reports, 1884.....	100 00
Secretary, 1st quarter, 1884.....	50 00
A. W. Sias, expense acc't.....	10 00
H. B. McKenney, printing	13 50
Lake City Graphic, printing.....	17 25
F. G. Gould, expense acc't.....	3 00
Reporter, copying and proofreading.....	60 00
Total.....	\$482 76

THE McMAHON WHITE APPLE.

After adjournment the Secretary wrote Mr. Taylor, asking a fuller account of the McMahon White apple, and received the following reply. An apple of such beauty, quality and productiveness, that will succeed as a top graft on the Duchess, is worthy of trial:

FORESTVILLE, MINN., February 8, 1884.

Oliver Gibbs, Jr., Secretary Minnesota State Horticultural Society:

DEAR SIR: I would say in reply to your letter of inquiry, that the McMahon's White Apple (the name I understood Mr. Plumb to give it) was obtained by me from Wisconsin in 1872. I grafted a quantity of roots and planted in nursery row the same year. Found it about like Utter's Red in hardness. I do not think it is valuable for us, except for top working. Have experimented in that way with it for thirteen years, and have found it to work on the Duchess in the most perfect manner, making a union that none but an expert could detect, in a few years. I have fruited it for eight or nine years, and now have large trees perfectly sound in appearance, with branches four or five inches in diameter and twenty feet or more, high. The fruit is very large, white in color, and of the finest appearance; good sour flavor, and keeps until March if put up with care. I have exhibited specimens of the fruit measuring $17\frac{1}{2}$ inches in circumference.

This is about all I can say in regard to it, except that I once thought it settled that it was the twenty ounce Pippin, or Ox Apple

of Downing, which it is not. Many good judges have been mistaken in thinking they identified it as this or that variety. J. C. Plumb may be mistaken, although I judge and hope he is not, as I have held it on suspicion long enough, and want the name settled.

Yours very truly,

BARNETT TAYLOR.

MEETING OF THE EXECUTIVE COMMITTEE.

The executive committee met at the office of the Secretary of State, in the capitol building at St. Paul, on Saturday, February 23rd, at three o'clock p. m. There were present President Truman M. Smith, of St. Paul; Treasurer J. T. Grimes, of Minneapolis; J. M. Underwood of Lake City; J. S. Harris, of La Crescent; and the Secretary.

PRIZES FOR NEW SEEDLING APPLES.

The society's long considered scheme of prizes for the propagation of a long keeping winter apple was taken up, perfected and adopted as follows:

- 1st. The seed is to be planted and the tree grown in Minnesota.
- 2d. It must be as hardy as the Duchess of Oldenburg, and as much hardier as we can get it.
- 3d. It must be as productive as the Wealthy, and the fruit equal to the Wealthy in size and quality.
- 4th. The apple must keep as well as the Willow Twig.
- 5th. To encourage fruit growers to make the effort to produce it, a graded system of premiums is offered as follows, payable yearly for ten years to the three sorts that come nearest to the standard, entirely separate from and in addition to the final award of \$1,000.

For the first five years, payable annually — 1st best, \$10.00; 2d best, \$6.00; 3rd best, \$4.00, and the 5th year, in addition to the foregoing, the following to the variety winning the highest cash aggregate of the premiums of the five years, \$25.00; 2nd highest aggregate, \$15.00; 3rd highest aggregate \$10.00.

For the second five years, payable annually, 1st best, \$25; 2nd best, \$20; 3rd best, \$15; and the 5th year, in addition to the foregoing, the following to the variety winning the highest cash aggregate of the premiums of the five years, provided the final standard of excellence is reached, \$500; 2nd best, \$300; 3rd best, \$200.

If either of said varieties fail in the foregoing qualities, and yet remain in the rank of 1st, 2nd or 3rd best of all varieties entered, it will be awarded a reasonable premium according to its merit at the discretion of the society.

Entries must be made annually with the Secretary of the society in writing on or before the 1st day of September in each year, and specimens of fruit and wood of the tree, and cions for distribution; be furnished under such regulations as may be hereafter prescribed, and one or more experts to be appointed by the President or by the society will examine all trees so entered and report on them before the award will be made.

The Society has already a reserve fund of \$600 at interest to meet their premiums when due, \$200 more already due from the State to add to it; and in 1885 will reserve the remaining \$200 to make up the \$1000. The interest at six per cent. pays the annual premiums on the scheme as offered, and leaves a surplus to be added yearly to the principal.

The other business done by the committee at this meeting was as follows :

On motion of J. T. Grimes, seconded] by J. M. Underwood, the salary of the secretary was increased from \$200 to \$400 per annum, commencing with the first of January, 1884.

Arrangement of program for summer meeting referred to President and Secretary.

Secretary authorized to continue his Portfolio in the Annual Report, and use his discretion as to matters of interest to be printed therein, relating to Agriculture or Horticulture, within the established limits as to number of pages of the report.

The list of experimental stations and their superintendents, and the rules governing them, were revised and adopted as follows:

University Farm, College of Agriculture, Minneapolis, Prof. Edward D. Porter.

State Experimental Fruit Farm, Excelsior, Peter M. Gideon.

Alexandria, Douglas Co., Fred Von Baumbach.

Lake City, Wabasha Co., Underwood & Emery.

Northome, Hennepin Co., M. Pearce.

Litchfield, Meeker Co., G. W. Fuller.

Carver, Carver Co., Charles Ludluff.
 Waconia, Carver Co., Andrew Peterson.
 Moorhead, Clay Co., R. M. Probstfield.
 Moorhead, Clay Co., F. J. Schreiber.
 Minnesota City, Winona Co., O. M. Lord.
 Lac qui Parle, J. H. Brown.
 Farmington, Dakota Co., L. E. Day.
 Owatonna, Steele Co., E. H. S. Dartt.
 Forestville, Fillmore Co., B. Taylor.
 Rochester, Olmsted Co., A. W. Sias.
 LaCrescent, Houston Co., J. S. Harris & Son.

The Secretary is to search for new and valuable varieties of fruit, and distribute cions and trees to the stations, but none are to be sent to any station until it is first ascertained that the superintendents named have facilities for grafting and planting, accept the trust, and agree to report to the society annually, or oftener if called upon, and after three years' growth of any variety, that they will furnish to the society a reasonable number of cions for re-distribution and trial if wanted. The Secretary may with the concurrence of the President, expend not to exceed \$50 per year for the purchase of cions or trees for the experiments at the stations. After the stations are supplied, any surplus cions or trees may be sent out to any other members of the society who are known to be suitable persons to grow them, on the same conditions as apply to the regular stations.

BILLS ALLOWED AND ORDERERS DRAWN.

M. Pearce, delegate to Mississippi Valley Horticultural Society	\$37.40
E. H. Cuzner, overpayment membership fee, refunded.....	1.00
E. H. S. Dartt, delegate to Iowa Horticultural Society.....	23.10
A. W. Sias, delegate to Wisconsin Horticultural Society.....	4.75
Executive Committee, expenses of this meeting.....	18.80

NOTE BY THE SECRETARY.

The winter apple we are seeking in offering the above prizes is believed to be within our reach; and it is also believed, that without systematic effort, based on the best knowledge attainable as to nature's laws of reproduction, variation and improvement in vegetable life, the chances are not better than one in ten thousand to get it; and it is further believed, that by using this knowledge we may not only get it speedily, but obtain it with a host of other good

hardy sorts that while of lower standard, will yet be of great value to our state. The laws alluded to are not quite as well settled and as free from variation as in animal growth; but the facts so far found, indicate that the process for us in this case is to use the hardy tree of best form and of the common apple race (not the Siberian crab) for the seed-bearing parent, and fertilize the blossoms of this tree with pollen from the large, good, well-shaped, long-keeping variety, of the best color in fruit we can find, and also, other things being suitable, the hardiest in tree; in other words, that the female parent is most likely to impart constitution and form to the seedling tree, and the male parent the quality and season of the fruit of it. Those who have the facilities can reverse the plan or vary it and note the results.

Hand manipulation is the surest and most direct road to success, and the isolation of BOTH PISTILS AND POLLEN must be as perfect as possible. Top-grafting a hardy tree to a long-keeper (of same blossoming time) so as to intermingle naturally, and then planting the seeds of the hardy sort is liable to give a gain; but the chance is more remote, as you have that "lusty stealth of nature," of which the bees and the winds are the agents, always to contend with and put aside your designs.

The new Russians will undoubtedly be the basis of some of the best work in this line, especially for seed-bearing parents. It will pay all our people to study the fruit trees and fruit blossoms, and read the Horticultural Report to assist them in finding "the motive and the cue" of thought in these interesting lines of study.

Members can be supplied with back numbers as well as the Report of 1884, and any person can become a member by sending one dollar to the Secretary.

MR. PEFFER'S PRIZE ESSAY.

The essay of Mr. Pepper having contained a number of confusing typographical errors, as printed last year, is herewith reprinted, and its careful study recommended in connection with the foregoing scheme for the production of a hardy, long-keeping winter apple.

PROPAGATION OF SEEDLING FRUITS.

BY GEORGE P. PEFFER, OF PEWAUKEE, WIS.

Mr. President and Members of the Minnesota Horticultural Society:

Your offer of a prize for an essay on the above subject is presumed to apply only to such fruits as will withstand the severities of the seasons of the Northwest, and, therefore, I will mention as the first condition the selection of seeds that are grown in this climate, and, for tree fruits, they should be from sorts that are of moderately slow growth; at least, short-jointed and thick-leaved or woolly. The larger the leaf, and also, the earlier the new wood completes its growth in the fall, the better. To have a hardy variety, the leaves must have plenty of time to elaborate the sap, on its downward flow, to harden the new wood and put it in proper condition for the winter. The leaves of late-growing trees drop prematurely, and the sap being in a crude condition, the wood is injured by cold or by sudden changes of heat and cold, in the winter, and the trees are more liable to blight in the ensuing summer. Seeds of such varieties are imperfect, corresponding to the imperfections of the wood. For varieties from which to select the seeds, take either our natural seedlings or the most desirable of the Russian apples. By reproduction, every generation gets more used to our climate, and can be grown further north and west, with success. If the variety should be an early kind, every time it is reproduced it can be grown a degree further north, and be hardy. A summer variety grown a number of degrees that way will get to be a fall variety, and even a winter variety, if so far north as to have only time enough to ripen its wood and fruit. As a rule, the fruit will always be fairer. If any should be grown further south, the fruit is smaller and more subject to rust spots, scales, etc., and to cracking of the skin, especially such varieties as are russety, as witness the Russians. You can multiply any sort by grafting, but it does not make it any hardier. The increasing hardness manifests itself only through the seed, and through seedlings the fruits are extended over larger ranges of latitude, or we would not have so many varieties in the world. In the natural process of repro-

duction by seedlings, there are rarely any multiplying of the same varieties owing to the mixings in the blossoms of different sorts, yet it is possible to make trees produce by their seedlings exactly their like in fruit. Isolation from other sorts of fertilizing pollen of any similar species, at the time when the flower-buds are ready to break open, is all that there is to be guarded against, and any tree that is blossoming in an orchard or garden, where no others of same species are near it, or, at least, so far away that no insects could carry pollen to it, will produce its like in fruit if the seeds are saved and planted; because the pistils will be fertilized from the pollen in the same flower. As an example showing the truth of this statement, I will give the following :

In the early days of Wisconsin settlement I knew of an orchard that was planted with small, one year old apple trees; the land was only cleared that spring ; it was in 1843, and there was not room to put them all in orchard rows ; so the most of them were planted in a nursery row, about twelve to eighteen inches apart. The land was white oak openings and was quite stumpy. Many of the little trees were destroyed by the plow, and by rabbits, and browsing from cattle, and but few were saved to be old enough to bear ; but in the year 1849, one of them had a few dozen apples on, which were the Gray Gilliflower. Mr. Hilliard, the owner, gave me a few specimens of the apples to take home for a treat to wife and children. We saved the seeds. Eleven seeds were planted ; eight of them grew ; we set the seedlings out when two years old. In 1856, two of them bore apples, and they were the same as the fruit of the parent tree. The next year the old tree hung full of apples, and Mr. Hilliard brought us a dozen more. We planted these seeds also, and one of the trees bore fruit the same year as the first lot (1856), but these seeds had got pollenized by some other variety, and the apples varied in character, some in shape, some in size, and some in quality. In other words the apples from trees grown from the seeds of 1849, were a'l alike ; from 1850, all different, There was no other tree in bloom in the vicinity of the Grey Gilliflower, when its crop of 1849 was set ; but the next year, three or four of the adjacent trees of other sorts had come into blossoming, though they did not bear fruit, and their blossoms had pollenized those of the Grey Gilliflower, and the mixed and changed character of the progeny from seeds of that year was the result of it; not one of that planting is like the mother tree, while all of the first planting are exact reproductions.

This proves that blossoms self-pollenized, or fertilized from pollen of same variety and tree, will produce their like, and that varieties come from cross-breeding.

But if other varieties are wanted to improve them or make them longer keepers, or change them in color or size, there must be an understanding about the blossoms, because most of them have stamens and pistils on the same flower, and, has been already stated, will reproduce themselves if alone. Therefore, it is necessary to understand which are the male and also the female organs, and find which predominates, and what influence the male or female has on the fruit, seed or stock, or constitution and hardiness of tree. If we do understand it, we can almost to a certainty raise or make any desired improvement, either in fruit or tree, or both.

Now, to raise a seed or seeds that will make a hardy tree, and at the same time improve the variety and be a good bearer, we must select for the female the hardiest and the best form of the tree, and form of fruit, and for the male, the earliness or lateness, quality of flavor and productiveness. For culture in fruit where stamens and pistils are in one blossom, and we have an early variety that is perfectly hardy and we wish to improve it and make it a late keeper, we must select for the female the tree that is the strongest and hardiest of the two varieties we like to improve, and when it is just commencing to blossom, cut off or remove the stamens below the pollen sacks or anthers just before the flower leaves or petals are opening in the morning, upon a spur or an upright limb or branch that is at an angle, so the spur with a bunch of flower buds can be covered with something that will protect it against other pollen falling upon it, or brought by bees or insects of any kind. A small glass bottle or jar, such as a quinine bottle or something of that kind, will do. Now, get a spur or bunch of blossoms that you want to use for the male—if already opened, all the better; but if the trees are quite a distance apart, best use two bottles; and put the second one on the spur before you remove it in order to save all the pollen, then go to the first tree you had protected, and change the bottles at once; put this second one (that is, the one from the tree used for the male or fertilizing side of the operation) over the spur where the stamens had been removed, cover the mouth with something to keep it closed, and as soon as the sun dries up the dew, and warms the air, the pollen will be ready, and then, by jarring or shaking the limb, the pollen will be seen flying all over inside, and the fertilizing is done.

Now, here lies the mystery: Which variety does control or influence the new growing seed? It will be observed that the fine dust of the pollen had settled on the tips of the pistils or stigma, which had a little shiny liquid on the tips, which, adhering to the pollen, dried it up, and the seed now forming, of which each has a stigma or open tube that reaches from the pistil to the forming seed in the core, ripens and contains the mixture of both varieties. If all the pistils are equally supplied with pollen, all the trees raised from these seeds would bear fruit alike, but as that is not often the case, each individual seed will have the predominance of either parent in a greater or lesser degree accordingly as they were fertilized. An apple blossom has generally five pistils. Each of them has from two to five stigmas, according to the propensity or vigor of the tree. Each stigma is formed from an embryo seed, and if fertilized will produce a live seed or germ. A germ has in itself the power to expand and grow and reproduce again. Each seed is an independent individual, and capable of varying from every other one. Therefore it is necessary to guard against having the blossoms exposed when they are opening if you want to improve the variety by this process. As to varieties to work with, I should use the Duchess or other Russians, or any of our Minnesota seedlings that are hardy for the seed raising, and use Wallbridge, Utter, or any next hardy sort of good quality for the sort to pollenize with; or if hybrids are wanted, take the hardest of the crabs for the female and any of the other named apples for the male. In this way an abundance of home-grown apples can be raised. All there is required is time and a careful hand to do the fertilizing.

QUALITY OF APPLES.

If we inquire at any commission house in Chicago or Milwaukee for the best table or dessert apple, they invariably will say we have Spitzenberg or Baldwin, if they get their supply from New York state.

Now the Spitzenberg, it is true, has the highest flavor, and the Baldwin a little of the same, but the flesh is hard and tough and indigestible. It is a mistake to call them dessert apples, as they are lacking in juiciness and dissolving properties. In my estimation, Jonathan, Wealthy, Northern Spy and Fameuse, are nearly or quite equal to the Spitzenberg in flavor, but how far superior they are as dessert varieties any one familiar with them well

knows. The reason of their superiority lies in their crisp flesh, which is yet so tender as almost to dissolve in the mouth. The more we get acquainted with the Wealthy the more we value it. I might mention the Pewaukee, but the flesh is coarser and is more for culinary use. For pollenizing in cross breeding these varieties would be preferable as named in their order; also Rawle's Janet or Westfield Seeknofurther could be used, if none of the others could be had. A few cions of such, grafted on some hardy standard or seedling kinds, would soon give the blossoms to work with.

For planting trees for cross breeding by distribution of pollen by wind and insects, little arrangement is necessary, as it is known that pollen will fly, or be carried a long way and pollenize any blossom that is just on the point of opening.

If any had already been open on the same tree or others in the same orchard, the pistils are just as likely to be fertilized from a variety forty rods, or even eighty rods off, as one close by or even from the same limb. Most buds throw out, from two to five, or more flowers or spikes, but do not all open at the same time and work naturally like sprouts on a potato; however, it would be well to set, perhaps, rows alternately with such trees as are selected for the mother or for the fruit, the seeds to be saved for replanting. If the wind should be from one side of the orchard for two or three days, when they are in bloom, the pistils on that side of the rows would mostly be fertilized from the neighboring pollen from that direction, except where insects carry the pollen against the wind. The only practical way to make sure of getting anything like the varieties wanted, would be to try hand work, either on a small scale as described, or by having the variety selected for the mother, surrounded by the different varieties to be used as males, and have a canvas tent to cover the first two trees, one year. The next year with the other, etc., so in four years, the same tree can be fertilized four times, and have all the fruit take only after the two varieties inclosed the same year. A tent could be used over the mother tree, and cut branches, full of blossoms, and inclose in the tent. Of course the tents have to remain until the petals and pistils dry or wilt. In this way a good share would be just what we would expect.

Always save the seed of the early variety, if that was the one that was hardiest and the best tree, if you want the new fruit to be after the male and a keeper. On the contrary, if you want early, save the seed from the opposite variety.

To plant the seeds for new varieties, prepare your soil the same as if you planted trees from a nursery. Stake out the ground and work the spot deep. The larger the hole and deeper the subsoil, from the surface, the harder you have to pack the soil when you fill it up again. Set the stake, or anything else you are using for a mark, then plant two or three seeds on the north side of it. If they are fresh plant them in the fall and cover about one inch with loose earth or mould. If dry, plant early in spring soaking the seeds first, and cover lightly, say half or three-eighths of an inch deep. Keep clean the same as your corn, potatoes or any hoed crops. If all the seeds should come up, remove the surplus either the first or second year.

To enlarge the orchard, transplant them, or fill out where any are missing; taking good care in digging them up to save all the roots possible. Unless you do so, those not disturbed will get the start of the transplanted ones. Mulch the first winter if on an exposed situation. Do so any way, so as to be sure the frost will not go below the tap roots. The only success we will have in raising good orchards will be by planting seedlings one year, or the farthest, two years old.

Transplanting should be done thus early because the main tap root is not disturbed. The further the soil is loosened the faster and farther these roots will go down, and the safer the tree will be.

The roots will not be killed because parts of them reach below frost, and if it should freeze up dry in the fall, those roots will supply moisture, when the frost is coming out of the frozen part, even if the earth takes it up.

The small trees should be watered in the fall if not mulched, because the tap root may not go far enough to be safe from frost.

Drouths are no injury to deep rooted trees. I am convinced pears of hardy kinds can be grown in the same way, because the farther the tap roots go down the lesser will be the surface roots, and certain changes in the weather will not excite the trees, and stimulate to excessive growth, and thus the sap can be controlled and the trees are saved against fire-blight.

If the seedlings should be raised in a small patch by themselves, they should be well taken care of and set out in the orchard the second year, with all the roots that can be saved on taking them up, especially the centre or tap root. If they should be wanted to graft new varieties (say the hardy winter Russian, if we ever get such) there would be a little time gained, either in grafting before planting out, or any time afterwards.

To take care of such an orchard and have it do well, it should be located on high or naturally drained clay or limestone soils and sloping to the east or northeast.

The cultivation should not stimulate overgrowth, and the laterals, or side branches, should be pinched in occasionally to form a good head. When three to four or five years old, if the trees show no blossoms, tie a wire around one of the lower branches, or girdle one, to make it sick. Do this in June or July, and the branch will get filled with blossom buds, and bear the next year. Always leave the lower branches shortened in to protect the trunk of the tree, and only remove them gradually, as the limbs you are training to form the head of the tree expand to shade the body.

Some will say this is rather a small business, to start an orchard in this vast northwestern country. We acknowledge it is rather a small beginning, but should the amateur be patient, persevering and industrious, and can estimate the value of small things, above all have a love for his business, he will not fail of his due reward. Other crops may be raised between the rows. These may be either of small fruits, such as currants, strawberries, or any other crop that will not interfere with the growth of the trees. Only a short time of patient industry, and the seedling orchard will produce its fruits.

SECRETARY'S PORTFOLIO.

Deferred Papers, Reports, Appendix, Notes, Extracts, etc.

ORCHARDING IN NORTHEASTERN VERMONT.

BY DR. T. H. HOSKINS, OF NEWPORT, VERMONT.

Vermont is often spoken of as a cold state, but the Champlain Valley and the lower half of the Connecticut Valley are not too cold to produce the great commercial apples of New England, the Baldwin, the R. I. Greening and the Roxbury Russet. Peaches are grown on the commercial scale near Brattleboro, and for home use on Lake Champlain as far north at least as Shelburn, while plums and pears of many varieties are grown for market about Burlington, and upon the islands of the lake up to the Canadian line, 45° north latitude. But in the mountains of northeastern Vermont the case is very different. In all of Essex, Orleans and Caledonia counties it is impossible to bring trees of any of the three above named varieties to bearing age, while no great success has yet been met with in growing plums or pears. Not only are the Baldwins, Russets and Greenings excluded by the climate, but nearly every variety of apple known and valued in southern New England, and classed as hardy there, fails if not to yield fruit, at least to do so profitably, in this elevated and wind-swept region.

From studying the reports of your society I am inclined to believe that in Minnesota exceptionally cold and destructive winters occur somewhat oftener than in northeastern Vermont, and that perhaps spring frosts do more harm to blossoming trees in some portions of Minnesota than with us. Minnesota is a large state, and the distance between its northern and southern boundary corresponds to a considerable difference in climate, so that I find some apples reported as doing well in Olmstead county, such as Minnesota Greening and Rollins' Pippin, not quite iron-clad with me on lake Memphremagog. On the other hand I see that there are portions of Minnesota where the Wealthy, and even the Duchess of Oldenburg, both thoroughly hardy here, are complained of. Therefore my experience, while it may be of use to some, can by no means be taken as a guide in Minnesota without considerable allowance not only for latitude but for longitude.

It is now seventeen years since, in 1866, I determined thoroughly to test the truth of the popular belief in this section of the state that apples, aside from Siberian crabs, could not be grown here.

I had one thing to encourage me. In the early settlement of the country, at the beginning of the century, seedling orchards were grown, and up to between 1840 and 1850 native apples of this class, including some kinds of considerable excellence, were produced in great abundance. These old orchards, many of them at least, became feeble with age, and all trees, old as well as young, were badly wrecked by being loaded and broken down in a heavy sleet and wind storm in 1848. After that the attempt was made to start new orchards, but instead of using seedling trees, as the pioneers did, young stock was bought from pedlars of New York trees, all of them varieties totally unfitted to the climate, except an occasional Fameuse, Talman Sweet and Red Astrachan, and these not strictly iron-clad. Repeated failures with these New York trees led many to believe that the climate had changed, owing to the removal of the forests. As a matter of fact this has made the climate warmer rather than colder, taking the yearly average, and there is no ground to believe that the winters are colder.

It was long before it began to be understood that all kinds of apple trees are not hardy alike, and that we must have hardy kinds. When this did begin to be realized, nobody seemed to know where to look for hardy sorts. When I began I determined to test everything called hardy, and in the first three years I had set out from three to eight trees each of over a hundred kinds, reported hardiest in Vermont, New Hampshire, Maine and Canada. Among these I found only three kinds that did not seem to mind anything about the climate. These were the Duchess of Oldenburgh, Tetofsky, and Peach of Montreal. In the meantime I was corresponding with western fruit growers, and searching the remnants of the old seedling orchards wherever I could hear of any. Out of a great many sorts from the west, I found only Plumb's Cider that endured our climate well, until I got the Wealthy, and these two to-day, constitute the only really valuable contributions to my orchard from the west. Many others indeed do *tolerably* well, but "tolerably hardy" fruit trees in a climate that demands "ironclads," are not the source of much satisfaction.

In 1870, I obtained from Washington cions of about twelve kinds of the Russian apples imported at that time, and in growing these, I soon realized that I had struck upon a strain of apples that cared nothing for cold weather. From these, and from others of the same importation which I got from those who had received them, the question of hardiness being eliminated, I have had only to choose for quality and season. For very early fruit, the only

hesitation has been between the nearly similar sorts of the Yellow Transparent family, including the White Transparent, Grand Sultan, Charlottenhaler, Sweet Pear and several others. On the whole, I now think that I prefer the Yellow Transparent, though Charlottenhaler is somewhat larger, and White Transparent of rather better quality. The Yellow Transparent is the most vigorous tree, and the fruit, in good land, is large enough to sell well. The season of all of them here, is the last week in August. Picked just before coloring, they ship and keep well for a summer apple. Tetofsky comes in the week after Yellow Transparent, and is objectionable only because it drops badly before ripening, shows bruises, and does not keep so well. Next we have the Duchess of Oldenburgh. I say next, but in fact the Duchess is our first market apple, the windfalls being large enough for pies, by the first of August, and its market season extending from then to the third week in September. The second week in September, Peach of Montreal comes in, a profuse bearer of an elegant looking apple of good size and first-class dessert quality when fully ripe. But alas, when fully ripe will not ship, and it is therefore valuable chiefly for a near market. It is also somewhat subject to spotting, not being nearly so fair as the Russian apples, although Prof. Budd thinks it is a Russian. It is certainly as hardy and thrifty, and productive as any of them.

Among the later fall Russians, I am strongly attracted to the Switzer. It is as large and handsome (though not so dark a red) as Red Astrachan, and far more hardy, equaling the Wealthy in that respect. The only fault I have yet found in it is, that it is sometimes slightly attacked by twig blight, yet it only loses a few twigs when crabs near it are wholly killed. The fruit ships well, and keeps several weeks after maturity.

Succeeding Switzer comes the Canadian apple, St. Lawrence. This, except the Peach apple, is the hardiest Canadian I have ever found. It is late in coming to bearing, and requires a good soil, but is productive when it gets to it, and fills a gap between Switzer and Fameuse, keeping well nearly through November. The fruit is as large as Duchess, more flattened, and heavily striped with a darker red. It cracks and spots, in some seasons badly. The tree is pretty nearly as hardy as Wealthy.

Of about the same season as St. Lawrence is a Russian which came to me from the Department at Washington as the Golden White. Excepting perhaps, Plumb's Cider, this is the most vigorous tree in my orchard. The leaves are large and thick, with a

heavy white down on the under side. The tree has been growing so hard that it is late coming to bearing, but it promises to be productive. The fruit is round, somewhat irregular, of medium size or larger, distinguished by a very small cavity, often none, with a fleshy stem. The color is a pale green, with some pale red on the sunny side. The flesh is white, soft, of a very mild acid, and though not rich, may be called very good. It attracted some attention at the fair of the Montreal Horticultural Society in September, and was thought to be a promising market fruit. I think some have this variety under a different name. If so they will easily recognize it by the above description.

Among fall sweet apples, the only one of much value that I have found is a Russian, the Prolific Sweeting. The tree is a good, upright grower, late in coming to full bearing, but then prolific, a handsome, large round, or slightly flattened yellow apple, of excellent quality for eating or baking. I desire nothing better of its season, September.

The Fameuse is an apple which we try to grow here because it is so extremely popular. Our trees are never healthy, still they hang to life and continue bearing as long as a limb is left. On the whole they yield some profit, though half of the fruit is unmarketable from spotting. They bring a good price, and are in eating about a month before the Wealthy. They do not keep, usually, beyond New Year.

Here I want to mention a Russian apple of which I have but a single tree, and the name of which I am not certain of, though I think it may be "Longfold's Apple." It has only borne for three or four years, and did not attract much attention until last year, when it bore a full crop, and proved to be a keeper. It is a little below Fameuse in average size, but shaped like it, of a darker red, and covered with a blue bloom like that of the Hyslop crab. It is perfectly fair, not so soft-flushed as Famuse, but of an excellent sub-acid flavor, with a good deal of richness, certainly, for a Russian. It keeps perfectly until spring. The tree is a moderate grower, but handsome and thrifty. This is the first winter Russian that I have fruited, and is an agreeable surprise. I have two other winter Russians of the 1870 importation, the fruit of which I have seen, although my own trees have not yet borne. These are the Borsdorf and the Little Seedling. Both are long keepers of medium size, and Borsdorf seems to be a very good apple, much preferable to Ben Davis. Little Seedling is a greenish yellow apple that keeps till apples come again, but is only a cooking apple. These however

are very interesting, because they *prove* that there are long keepers among the Russians, which many are slow to believe.

And now I come to Minnesota's one grand contribution to our stock of iron-clad apples, the noble and glorious Wealthy. With me it grows to perfection, both trees and fruit, the latter running fully as large as Baldwins, handsomer, better for dessert, and keeping just as well side by side in the same cellar. I have now 400 bearing trees, and I just love to take the croakers who have been telling me so long—"You can't make apples pay in this cold country"—right in amongst them the last of September, and see 'em "give it up." There is a seedling of the Fameuse from Canada, the McIntosh Red, which for several years I have thought might be a rival to the Wealthy. In quality it leaves nothing to be desired, and it keeps pretty nearly as well, but like its parent it spots and cracks, and as a market apple for profit the Wealthy sails right round it without any trouble at all. On deep rich soils like those of the St. Lawrence river banks, where alone I have seen Famuese and St. Lawrence grow in perfection, the McIntosh, I have no doubt, will be "just splendid." I have seen specimens of it as big as a pint bowl, that were everything one could ask for. The tree is somewhat hardier than Fameuse. Among the native seedlings of this vicinity I have found two that are valuable. One, the Magog Red Streak, is rather supplanted by the Wealthy, yet not altogether, since it is a choice pie apple as well as a good eating apple. The tree seems perfectly hardy, the shoots never winter-killing, but it is somewhat subject to bark blight at the junction of the limbs, thus making some of the trees unsound. It bears not young but abundantly, the fruit being medium to large, more or less ribbed, yellow, with read streaks on the sunny side. Keeps well, but rather unevenly.

My second native, Scott's Winter, I like better and better as I have longer experience with it. The tree is iron-clad, free from defects, except that it is subject to bark-splitting at the ground while young. Its growth is vigorous, and it begins bearing as early and bears as much as the Wealthy. In size it is a good medium; the fruit is roundish oblate, dull yellow, heavily striped and often covered with dark red. It keeps from two to three months longer than the Wealthy, or until the middle of June with me. It does not begin to soften much until April, when it becomes very good, a brisk, spicy acid, mellowing to sub-acid in May. It is preferable to and more salable than the smaller russets, besides being hardier. I have about 300 trees of this variety.

THE FUTURE OF ORCHARDING IN THE PRAIRIE STATES.

BY PROF. J. L. BUDD, AMES, IOWA.

The apple, pear, and most of our cherries and plums, are not natives to our continent, and their introduction into the states west of the great American lakes has not been guided by the scientific skill in selection which characterizes such work in the colonies of all the governments of Europe.

Without exception, the scientific observers connected with the early surveys of the illimitable prairies of the west, interpreted the absence of the conifers, the rhododendrons, the mosses, and all the characteristic trees and plants of the more equable regions nearer the coasts and lakes, to mean an intercontinental climate of extreme changes in temperature and humidity.

In those early days of prairie settlement, such men as Judge Knapp, Dr. John A. Kennicott, Robert Russell, and J. G. Cooper, unitedly expressed the opinion that the world had no counterpart of our plains, in soil and climate, except on the great plain which covers, like a blanket, fully three-fourths of Europe on the north-east. These men, in connection with Arthur Bryant, Hon. G. P. Marsh, and many others, also predicted, in those early days, that unless systematic timber planting was commenced and carried forward, to offset the destruction of the dense growth of prairie grass, and the effects of opening the clogged drainage centers of the primitive prairies, consequent upon occupation and cultivation, the already fickle and extreme climate would change for the worse as the years went on.

With such clearly expressed views as to the real nature of our climate, it seems passing strange to the people of Europe so long accustomed to well equipped and endowed experimental stations, that we have never attempted to row our own horticultural boat, but have permitted the nurseries of the eastern states to do our importing of trees and shrubs, from the mildest portions of southern Europe, mainly, indeed, from the nurseries of Thomas Rivers, in England, and Andre Leroy, in southern France. Our plan really

has been to try everything which our eastern friends had to offer, and hold fast to that which was good. Unfortunately for our interests, south Europe has very few varieties of the fruits which will long survive in our climate, and the very few we have received are really strays from the east plain of Europe, or their seedlings, grown on our own soil.

As instances of real iron clads over broad expanses of our prairies, all will think of the Duchess, Gros Pomier, Fameuse, Drap de Or and Wealthy; all but one strays from the east plain, and that one beyond doubt a seedling of the Duchess or Tetofsky.

Of pears we have not one tree iron clad, and the nearest we have—the Besi de la Motte and Flemish Beauty—are from Poland, on the borders of the east plain, but modified by the breath of the gulf stream.

With cherries we are quite as unfortunate. The Dukes and Bigarreus of the east utterly fail with us, and the early and late Kentish and English Morello, in addition to short life of tree and irregularity of bearing, are far lower in quality than any one of the Griottes grown by the train loads on the plains north of the Carpathians.

As to plums, without thanks to our eastern friends or to south Europe, we have been more fortunate, as Nature has provided us with better native varieties than I know to exist elsewhere.

Beyond doubt, we have lost millions of dollars, and an untold amount of time and faith in unsystematic trial of fruits adapted to more equable climes. Surely the time has come when we should unitedly give trial to fruits of like climates, so far as they are commercially obtainable. Perhaps ultimately our favorite fruits will be seedlings of those we first introduce; but the only safe line of experimentation is based on the assumption that the future favorites of our orchards of the apple, pear, and cherry, will come from climates fully as severe as ours, or will be the seedlings of such varieties grown on our own soil.

With the hope of aiding in this systematic experimental work, so much needed, I will offer a few suggestions, based on a careful study of the climate, soil, and fruits, of inter-continental Europe, in the summer of 1882. These hints are formulated on the well known fact that every part of the Mississippi basin is subject to extreme summer and winter varieties of temperature and humidity of air, consequent upon the varying winds, and that trees for the southern and middle sections of this basin must have all the re-

quisites of those for the north, except the mere ability to endure a very low temperature.

Southern Illinois, Missouri and Kansas, may safely experiment with the apples, pears, cherries, plums, apricots, nuts, ornamental trees and shrubs, of the plains of northeastern Austria, for the western portion, and of Transylvania for the eastern portion. Here are found late keeping varieties of the apple, comparing favorably in size, beauty, and quality with the best known, growing on trees with foliage as perfectly adapted to a varying air as our Duchess. Here also are found many varieties of the pear with the perfect foliage of the Chinese sand pear, yet producing fruit nearly equal to the best sorts of France and Belgium. We have less reason to believe they will be subject to blight to a serious extent, as for ages they have been subject to inter-continental extremes like those of our valley.

In this region will, in like manner, be found the coming cherries for the dry belt where the extreme winter temperature does not reach lower than from fifteen to twenty degrees below zero.

The plains of Galicia are checkered with lines of cherry trees along the sides of all highways, and marking the division lines of estates to an extent not found in many parts of Europe. The varieties, too, are all new to an American. A careful study of their leaf structure, fruit, habits of growth, etc., will convince the most skeptical that we have gone sadly astray in selecting fruits for an interior prairie climate. The Griottes, with small pendulous branches, and fruit with colored juice, are generally used for roadside planting, as the trees do little shading on account of their small size, and the fruit can be used for dessert, culinary use, and for the favorite drink of high and low known as "Kirschwasser." In every respect the fruit is far superior to our Kentish cherry, or any one of the morello type we know. In the fruit orchards, and on the grounds of land proprietors, we find many varieties of a race of sweet cherries not known to us. With the round spreading top of the Morellos, they have the excellent fruit of the tall growing heart varieties, and a leaf that can defy our summer changes. Some of the Amarels of this region seem a cross of this sweet cherry with the form of the Morello of which our Lieb is a type.

The apricots of Galicia and Transylvania, and their form of English Walnut (*juglans regia*) are equally worthy of trial in the Missouri belt, together with their filbert, currants, gooseberries and even grapes.

Though we have failed with the French grapes, the north-eastern varieties are well-worthy of trial, as their foliage will stand our air quite as well as our native *Labrusca*. We saw on the Volga many tons of dried grapes from northern Persia and Bokara, which were infinitely superior to any of our home sorts. Where they will endure the winters they are eminently worthy of trial.

In this region no hardier peach is found than those we have. The coming peach for the Missouri belt is from northwestern China. While equal in fruit to our best sorts, it is able to endure greater extremes of temperature.

The belt across the Mississippi basin corresponding to southern Iowa, may experiment with the same races of all the fruits, and from a portion of the same great plain, *but farther to the east*.

The provinces of south Russia, east of Poland to Kiew, are well supplied with such choice fruit, and the soil and climate are as nearly identical with ours as they well could be.

Many of the varieties of the Galicia belt will not be found, but their places are taken by others but slightly, and if at all, lower in the scale of value. The most positive change is with the pear. Many of the best dessert varieties here become tender, unproductive and short lived, and their places are taken by slightly coarser varieties of the Bergamot and Grucha type. The best of the Griotte cherries are still found, and many varieties of the Glaskirke, and a form of the Jeans much like our Dukes, but with different leaf and a lower, more spreading top. The *juglans regia* is still productive, but is sometimes injured by the test winters.

For the belt across the valley corresponding to *central and northern Iowa*, the fruits of the black soil prairies of the great provinces of Orel, Koursk, Varonesh and Saratov, in central Russia, will best meet the requirements of soil and climate. Apples, pears, cherries and plums are yet found of such size, appearance and quality as would surprise any American horticulturist suddenly set down in the midst of one of their great commercial orchards. The visitor will rarely find a variety of any of these fruits which he found six hundred miles eastward. The very few exceptions, such as Autonovka, and Longfield apples, and Bessemianka and Red Bergamot pears, we are told at once are strays from central Russia, thriving equally well in a less extreme climate, as does our Duchess apple. Excellent forms of the Griotte cherries are still found and many varieties of the low-growing sweet cherries and Amarels are grown, with greater or less satisfaction, depending

upon soil and mode of growing. The apricot and mulberry are yet grown in considerable quantity, but the varieties are lower in quality for dessert use than farther west.

The belt corresponding with *Minnesota, up to the 45th parallel*, including southern Dakota and northern Wisconsin, will reach the highest attainable success with the fruits of Simbirsk, Penza, Riazan and Tula, on the north line of the black soil section of Russia. The visitors to these little known provinces, reaching up to the 55th parallel of north latitude, will be surprised to find so many varieties of excellent apples for all seasons, and so many variations of the indigenous Bergamot and Grucha pear, most of which are excellent for culinary use, and a few are from fair to good for eating. The only forms of the cherry grown in quantity are of the Griotte race, and the trees are grown in commercial orchards in *bush form*, with several stems, and pruned on the renewal system of taking out the old wood. In size, flavor, and amount of grape sugar, they far excel any one of the Kentish type found in south Europe.

To those who may conclude that the apples of this high latitude in Europe will materially change their season of maturity when grown in the Minnesota belt ten degrees farther south, it will be well to suggest that the prevailing summer winds of this part of Russia are from the southeast, coming up from Arabia, Persia, and the heated steppes of southeastern Russia. Hence the average summer temperature is really higher than that of the Minnesota belt across our valley, while the winters are much colder and with less average snowfall.

In the extreme upper portion of our valley in *northern Minnesota and Dakota*, even in the great valley with the northern trend at Lake Winnipeg, the possibility of successfully growing the apple, pear and cherry exists. The ancient provinces of Kazan, Nishny, Novgorod, and Vladimir, even north and far to the east of Moscow on the fifty-seventh parallel of north latitude, grow apples for all seasons, of excellent quality in a commercial way. In this coldest orchard region of the world, the little trees seem as hardy as the Siberian crabs, yet the fruit sells well in Moscow in competition with that from the south.

The far northern pears of this section are quite as hardy in tree, but the fruit is too low in quality for consumption in the large cities; yet it is grown in great quantity for culinary use among the peasants, and for exporting to Perm on the northeast verge of the plain. As an ornamental tree, this far northern form of the Bergamot has much merit, and it gives us a hint of possibilities in

the way of originating, by crossing, pears of excellent quality for the extreme Northwest.

The cherries of this region have had a historic record for centuries. In Vladimir one hundred and fifty miles east and north of Moscow, they are grown in quantity too surprising for popular belief in our valley. Though somewhat smaller than the best Griottes of the south parts of the plain, some of the Vladimir varieties are nearly sweet and of decidedly good quality for any use. That they can be grown as far north as Lake Winnipeg, in Manitoba, we do not for a moment doubt.

Plums approaching our Damson in quality, and much resembling it in size, form and color, are grown in quantity in this far northern section of the steppes. That they will prove an acquisition to the extreme Northwest, is beyond doubt, if the curculio will respect them to the extent of giving us an occasional crop.

These hasty suggestions as to the adaptation of the fruits of special portions of the greatest steppe section of the world to special belts across the prairie states of the West, must of course be of a general character. In practice they would be modified by the varying soil and climate of the east and west portions of each belt, and the belts would overlap with special changes of soil, elevation, exposure, etc. The only purpose is to outline some profitable lines of work for the experimental stations now in process of organization and development in all the states of our valley. We have learned that the process of acclimation is a tediously slow one with our trees, and I believe our people are about ready to encourage the policy universally accepted by the European governments in the management of their colonies viz: The introduction of cereals, grasses, fruits, shrubs, etc., from like climates and soils if they can be found on the earth's surface.

With the limited pecuniary means at command we are doing what we can in the line indicated on the grounds of the Iowa Agrecultural College at Ames. We have now growing specimen plants of the apple, pear, cherry, plum, apricot, peach, juneberry, walnut, ornamental trees, shrubs, etc., from every part of the great east plain of Europe I have named. Their summer and winter behavior for the past two years in our climate has been exactly in accordance with what we might expect from their relative position in their natal home. To briefly illustrate: the leaf of the Richmond cherry has been defective with us for the last two years, and last winter the trees were killed to the snow line. On the other hand, the Griottes and the Russian Glaskirke varieties have main-

tained perfect foliage, and have been unharmed by the test winter. In like manner the Flemish Beauty pear has not had for the past two summers a single leaf free from brown fungus on the under surface, and last winter the trees were either wholly killed or so lowered in vitality as to be really worthless. The Besi de la Motte, from the edge of the great eastern steppe, has maintained healthy foliage, but its wood was slightly colored by the test winter, yet it has made rapid and healthy growth the past summer. The Bessemianka, Trukavetka, and other pears from central Russia, have maintained perfect foliage—except slight injury by the pear leaf mite—and the terminal points of the shoots were as clear and bright last spring as the wood of the Russian poplars. Our apples of the grade of hardness of Ben Davis, Jonathan and Dominie, were defective in leaf for the past two years, and last winter were irreparably ruined. On the other hand, our old varieties from the east plain, or their descendants, and over two hundred varieties recently imported, started from the terminal points where grown on rich garden soil.

Yet our collection *is too varied for any one experimental station of the West*, as it embraces varieties which will do best in the Missouri belt, and varieties which should do best in the belt of North Dakota and Minnesota. If the experimental work could be distributed, and each of the belts across the valley I have tried to indicate could experiment with the products of its corresponding section of the east plain, the work could not fail to result in advancing our horticultural interests. So far, in talking of Russian fruits, we have not taken into account the enormous extent of the empire. We do not want the fruits of St. Petersburg, or of any part of the coast section within 300 miles of the Baltic. That we do want the fruits of the provinces named in this connection, I am equally certain, if properly distributed over our great valley. We must never forget that we must have in our valley, from the Missouri belt northward, varieties of all the fruits that will maintain perfect health of foliage, or we cannot expect paying crops of perfect fruit. A tree may endure our winters passably well, yet on account of leaf trouble during our dry hot summers, fail to develop the cell structure in the wood in the perfect way needed for holding and perfecting the fruit crop. With the advent of varieties as perfect in leaf as the Duchess apple, the Bessemianka pear, and the Vladimir cherry, we may expect a show of blossoms to be followed by perfect fruit.

The crying want of the Mississippi valley is well endowed experiment stations. With their aid we may be able to walk without the leading strings which so far in our history have been furnished us by the nurserymen of the eastern states.

[NOTE.—Foster, in his work on the Mississippi Basin, compares it to the Russian steppes, and says: "Starting from Lublin, in Poland, about latitude 51°, and going eastward to the river Lena, we traverse 130 degrees of longitude, or more than one-third of the earth's curvature, without meeting an elevation that would precipitate the moisture of the southwest current." Over this anciently occupied interior plain fruits are grown.—J. L. B.]

MARKET GARDENING AT LAKE MINNETONKA.

To the Members of the State Horticultural Society :

When our Secretary assigned me the task of reporting on market gardening and small fruit at Lake Minnetonka, I think he did not comprehend the extent of the work before me.

I will try to give you a few outlines, but not a detailed report. You doubtless have seen the lake or a part of it, but can form but a faint idea of the size and amount of traffic carried on there in the short space of time the summer guests are with us. We have a lake with 150 miles of coast, and according to the Minneapolis Tribune of Jan. 3d, 1884, we have over \$1,600,000 expended for the accommodation of tourists; and you are well aware that people come here to eat and regain their health.

The season opens about the middle of June, and closes the last of August or the first of September, which makes it bad for gardeners to supply all of their demands. I can no better tell you the amount of demand, than to give you the figures of two items that I furnished the Hotel St. Louis in one season: Green corn over 1100 dozen, and of peas, 70 bushels. We have to raise a general assortment from green corn and peas, down to gumbo and garlic. We have now six regular gardens around the lake; one located on the north shore below the Lafayette Hotel, one near Mound City, three near Excelsior, and my own at Northome, near Hotel St. Louis, besides quite a number of others that raise more or less of vegetables to sell. Still a large amount is shipped from St. Paul and Minneapolis. We ship more berries than are consumed here at the lake.

The past season has been a favorable one for both strawberries and raspberries, and at very good figures too. I cannot tell how many there are engaged in raising berries. I find in looking over my book of sales for the past season, my first sale of strawberries was June 20th, and strawberries continued until raspberries began to ripen. The last sale of raspberries was Aug. 24th, making the season of berries over two months.

I cultivate the raspberries the first season after setting, and after that I mulch heavily with bagasse from my cane mill, so that they do not need the hoe.

I have a patch of Philadelphia Red that have fruited eight seasons, with a full crop the last season, and shall let them stand until they fail to pay.

KNIGHT H. WHIPPLE.

Northome, Jan. 15. 1884.

APPLES OF WINONA COUNTY.

By O. M. LORD, OF MINNESOTA CITY.

The Horticultural Report of 1873 gave a flattering statement of fruit prospects for Winona county, which at that time was not considered as exaggerated; but with the experience of the last ten years with apples, the statements made in that report seem almost incredible. Many of the orchards which had done so well up to that time and which gave such fine promise for the future, do not now exist.

According to the statistics made by the assessors for the year 1879, the number of apple trees in the county was 65,000; the number in bearing about 25,000, and the number of bushels produced about 8,000. These statistics are not wholly reliable as they are found not to correspond from year to year. For instance, two years later, or for 1881, the number reported was 44,308; a decrease of 21,000; while the number of bearing trees are 21,481, a decrease of only about 4,000. The number of bushels is not given for that year. For the year 1882 the reports show an increase of 2,000 in number of trees, but a decrease of 1,000 in bearing trees, while the number of bushels is 18,716. Though these discrepancies occur,

the statistics are probably more nearly correct than any person could estimate; and they form something of a basis for approximation.

The number of farms in the county is 1913. The highest estimate for bearing trees would give each farm 13 trees on an average. These figures are only useful in showing the large number of farms without any trees, and for showing our capabilities, if each farmer would plant 50 good trees.

In comparing Winona, with some other counties, which started in fruit raising several years later, it has not kept up with them, and hardly maintains its early reputation. The counties of Carver, Scott, Dakota and Washington, produced in the year 1880 about 5,000 bushels each: Fillmore & Wright upward of 7,000; Hennepin, 12,560; and Le Sueur, 13,360. Judging from our early success, this county is naturally as well adapted to fruit raising as any of those named except Le Sueur and Carver.

The most marked success has been met in the valleys and upon the ridge land contiguous to the Mississippi river. The opinion is prevalent that the ridge lands are surest and that they are producing the best fruit. There are, however, some fine appearing orchards upon the prairie lands of the west and southwest parts of the county: notably, that of Mr. C. L. Blair, of Saratoga, probably the oldest and largest in that vicinity, though there are several younger orchards in that and the adjoining towns that promise well. These prairie orchards contain but few varieties, the Duchess predominating, and for crabs the Transcendent and Hyslop are best known. Mr. Hohman, located in a small valley a few miles above Minnesota City, planted an orchard of the two last named varieties, intending to manufacture cider and vinegar. His crop this year was about 400 bushels; none of which were manufactured as they readily sold in the Winona market at a fair price.

Of the old stock of seedlings, spoken of in the report of 1873, in the paper by Mr. Ely, only a very few remain, probably not more than 100 in all. A few of these appear sound and healthy, and have borne good crops. President Harris has carefully examined some of the trees and tested the fruit, and pronounces them well worthy of cultivation.

If we are to look for success in apple raising in the direction of our own seedlings, here is a small field for a starting point.

In the orchard of Mr. Whetstone (the old Campbell orchard), where the seedlings have died, their places have been filled with Duchess, Haas, Ben Davis, Utter's Red, Fameuse and Wealthy, and

some other varieties, many of which have done well. Last year's crop was a good one. The crop this year was small and the quality not as good as usual.

Mr. Samuel Bates, of this town, was quite successful this year as well as last. He numbers twenty-five varieties, having some promising seedlings of his own. His largest yield this year was of the Duchess. While the old seedling trees were prosperous, Rollingstone valley could show several fine appearing orchards, but now, taking out those of Mr. Bates, Mr. Bryan, and Mr. Whetstone, there are few left deserving of special mention.

In the town of Winona, the old orchards of Mr. George Clark and Mr. Hardwick are still in fair condition, Mr. Clark having secured several premiums at the late State Fair for character and variety of fruit. Mr. Knopp, of the same town, has the most acres (about twenty), set with apple trees and also the most ground in small fruit of any one in the county. He is regarded as a very careful and successful cultivator, having grown much the largest amount of fruit of any one in the vicinity.

The orchards of Mr. Buck and Mr. Rowell continue to produce fine fruit. All the last named being located in the valley contiguous to the river.

The town of Homer produces a larger amount of fruit than any other of the county, a large proportion of which is grown upon the ridges or high lands. Their fruit does not come into market so early as that from the valleys, *but there is no doubt as to its superior keeping qualities.*

But with all there is raised here, the market has at no time been overstocked, and probably an equal or greater amount of fruit from other states has been brought in for sale.

This fact of itself should be an inducement to plant more trees. I am aware of the discouragement one meets, when a single winter will destroy the hopes and labor of years, but we have been successful, and we may be again if we try. If we were to judge of the capacity of this county for producing corn by this year's experience, we might hesitate to plant.

The tendency has been for a few years back to increase the area of small fruits, rather than apples, but there is a growing feeling of greater security, as home nurseries are more generally patronized, and more care taken in the selection of hardy kinds. The superior advantages of home grown trees have become so well known that it is doubtful if glib tongued Dayton, Ohio, or iron clad northern Canada, can again take eight thousand dollars out of this county for nursery stock of no value.

*CONDITIONS OF PROFITABLE FRUIT CULTURE
IN MINNESOTA.*

[Read before the Mississippi Valley Horticultural Society, Kansas City, Mo.
January 23, 1884.]

BY OLIVER GIBBS, JR., OF LAKE CITY.

APPLES.

The first condition is that the grower possess a courage that does not quail upon the brink of any earthly woe.

The second is that he love his trees.

The third, that he study his subject thoroughly to learn all the known laws of adaptation.

The fourth, that he select for his main planting only the few hardiest; and

The fifth, that he keep out a liberal line of experiments, according to his means, and be ready to branch out in good time.

In regard to the first condition : No other state has been such a slaughter ground of apple trees, as Minnesota. Nearly every farm that was opened from 1850 to 1860, when all the southern and central sections were settled up, has had a succession of orchard funerals. First, eastern and southern grown trees, next western trees, then Canada trees, then home grown seedlings, and lastly the crabs ; all are gone, of these old plantings, but the Duchess of Oldenburg and some of the crabs in general, and, in particular, here and there a survivor from some other sort that is entirely unable to give any account of itself.

Many of these ^alost trees lived to bear fruit and give promise of long life and profit. One farmer in my neighborhood, from a small orchard of two or three hundred trees, had five hundred bushels of choice apples, and was peddling them around town from his wagon, like potatoes. The winter of 1872-3 froze up dry. In the spring following, his Plumb Ciders, his Fameuse, his Saxtons, his Jonathans, his Golden Russets, his Talman Sweets, and all that ilk, had not a live root remaining, although potatoes left undug in the fall in ground adjoining, lay through under the deep snow-drifts, and came out perfect in the spring. One may think

he knows the reason of all these failures and how to avoid them in the future; but let him be ever so well posted, when he comes to open his purse for a new purchase, and contemplate the labor, the use of his ground and the possible chances of another failure, here is where he needs the courage, a courage like that of Peter M. Gideon, originator of the Wealthy apple, who, for twenty years, went ragged in the battle for apples, through "frosts and fasts, hard lodging and thin weeds," but said all the while, "I will grow apples or leave the state; and I won't leave the state!"

Love for trees is perhaps more necessary to success in severe climates than it is in mild ones. Nothing so well keeps up an interest and a watchful care. Trees need more care in Minnesota than in Missouri, though they get none too much of it anywhere. It must be a love akin to that of parents for their children, of a lover for his mistress, a husband for his wife, of friend for friend—a love for their society, for their beauty, their protection from all danger, their help in time of trouble—an enjoyment of their budding and blossoming time, their growth, their fruitage, until and through the autumn when they hang out their crimson, russet and golden banners, vying with all the lovely colors of the wooded hills, and onward to shield them from harm during the white-robed period of their winter's rest. A man who will bark a tree in cultivating, if he can avoid it, or who having done it, will not hasten to bind up the wound as he would upon the limb or body of a friend, is not fit to grow apples in Minnesota. If he love not his trees, he is liable to put it off, "time is too valuable, something else I can do will pay better." Pay! a man must feel that nothing else pays so well as to keep himself and his associates out of trouble, and he must have that feeling for his trees. He must feel hurt when they suffer, and guilty when he neglects them. Nothing but love for his trees will give him this feeling. "I would like to look through your orchard," I said to a German farmer several years ago, as I was driving by his house. I had just passed his orchard and noted the clean ground, the smooth healthy look of the trees, their general thrifty and well kept expression. "Come in, I will show you." "How nicely your orchard looks," I said, as he was pointing out the different sorts and telling me their names. "Oh, yes," he replied; "*I love my trees!*" The words were few, but such as they were, they gave me, with the man's own expression of countenance and another glance of mine, up and down the rows of his pets, a good long lesson that will never be forgotten.

Adaptation: This is too great a question to discuss in this paper. There is first, and foremost, climatic adaptation, and this is something that seems to require centuries for its growth. That we must look beyond our own country for present success in selections of races adapted here, is evident from the fact that nowhere else in America, where apples have been grown, is there any such climate in reference to summer and winter temperatures, dryness of air, and the peculiarities of rainfall, all taken together. That we can find this adaptation in some of the older countries abroad and transplant it here, is indicated by the further fact that all the sorts now growing and showing adaptation to Minnesota climate, are traceable to an origin in those countries where there are similar climatic conditions. We have the history of the Duchess of Oldenburg. This variety was obtained by Thomas Andrew Knight, President of the London Horticultural Society, towards the close of the last century, from Simbirsk, Russia, with forty other sorts, sent him by the British engineers who were employed by the Russian Government in the improvement of navigation on the Volga. It afterwards went to France, there they dropped its Russian name of Borovinka, and called it by its present name, and from thence, it came to Canada and thence down the Atlantic Coast and across the river St. Lawrence, and everywhere over North America. It never attracted any pre-eminent attention over many other sorts until it came into those parts where its Russian adaptation to extreme cold, extreme heat, and extreme aridity of air and dry soil, singled it out as the one only reliable variety. Knight made many crosses with his Russian apple trees. They too have gone over the western world. When we see a negro, we know he is from Africa, wherever he was *born*, as we call one of the later processes in individual life; when we see a mulatto, we recognize his African blood, and so it is with Russian trees. The expert student sees their blood in form of tree and branches, in buds, in blossoms, in leaves and fruit, and their crosses can never be hidden till they fade down by division and by prepotency of mingling sorts beyond the reach of the senses to distinguish them. In fact we have found out almost enough already to declare whenever we hear of a previously unknown sort having done well through a period of seven or eight years, without seeing it, "It is a Russian." Our Minnesota Wealthy, now celebrated as a profitable apple for the North, passes, by the tests of botanical science, into the Russian category, and acknowledges thence its adaptation. Second, there is adaptation to high lands and adap-

tation to low lands—to sandy soils and to clay soils. There are trees that have a general adaptation, and others with special adaptation. While the Dutchess is general and the Wealthy nearly as much so—if a farmer have a valley location, sandy or where the water comes near the surface, let him plant the Wolf River, a variety whose parent tree now thirty-two years old in Waupaca county, Wisconsin, stands where its roots touch the waters of the river, whence it takes its name, and whose progeny scattered well throughout the West, show, as I am informed by J. C. Plumb, of Milton, the same adaptation to low, sandy or wet soils. A large State like Minnesota has variable climates and soils. There are adaptations for all, that must be studied. Russia, as said by Prof. Budd, is a great country. It has its counterparts probably for all the climates and soils of our American apple belt. It not enough to say *Russian*. We must know from what part of Russia. It is not enough to say Minnesota. We must know what part of Minnesota. Is it where the dry cold arctic winds sweep up the valley of the Red River of the north? Is it where the moist winds from the Gulf of Mexico, or the St. Lawrence and the great lakes, the hot air of the southwestern plains, or the mild breezes of the Pacific, fugitives from the Chinook, squeezed of their vapors in passing over the steeps or the forests of the Rocky Mountains, mostly or in part prevail? Is it on the wide prairie sweeps, the bluff lands with their air drainage, above as well as below ground, the timber and prairie openings, or the dense forest regions of the big woods? All these are questions which must be studied in order to make fruit raising profitable in Minnesota.

A man must not begrudge a dollar for his state horticultural society, or two dollars for the Mississippi Valley Society, to secure him its reports to read on all the vital points in the business, and pay twenty dollars for a worthless bill of trees that the books would have warned him of.

Selection of a few only of the hardiest for general orcharding is important for many reasons, but these reasons are so open and palpable that it almost seems a waste of time to mention them. A man must go for sure things to some or to the main extent to keep his courage up. Everlasting failure or liability to it will beat the toughest orchard crank in time, as it does the Keeley motor or the inventor of perpetual motion. The man in Wisconsin who said several years ago, before the Wealthy was found, "If I were to set out a new orchard of one hundred trees, I would plant ninety-nine Dutchess and one Dutchess of Oldenburg," was not far from right.

That would be sure to be profitable. The only orchardists in Minnesota to-day who are making any money on apples are the ones who did about the same thing, or who divided their planting between the Duchess and the Wealthy. There are many other sorts coming into favorable notice, seedlings and imported trees, that promise to show equal, and in some respects superior merit. It even looks as though we are on the eve of a sudden extension of our list into a large variety of apples, and that we shall add to the acknowledged beauty and high quality of the apples we have, the merit of long keeping in the new sorts, and be able to dispute the markets of the world with New England, New York, Michigan and Missouri ; but on the experimental list let them stand, with reasonable hospitality, for further acquaintance, before putting them into orchards on a large scale, by men of moderate means and without expert knowledge in making selections.

PEARS.

The pear for our adaptation we have yet to find. Our hope is in Charles Gibb and Prof. Budd.

THE CHERRY.

The cherry went out of general view when the winter of 1872-3 killed our Early Richmonds. The Germans of Carver county, latitude about 45°, have had the Ostheim for over twenty years, unknown to the Minnesota Horticultural Society till now. They say it is hardy enough there, and is adapted to the climate, that it blossoms late in the spring, bears heavy in favorable seasons and is a large, good, dark-colored cherry. They propagate it only by root sprouts. Mr. Charles Ludluff, of Carver, who obtained the first trees from Germany, says that if grafted it must *not* be on sour cherry stocks. Whether it will be hardy west of the big woods or in the northern part of the State we do not know. We want to try for the severest tests the Russian Vladimirs, and shall do it as soon as we can get them, by importation, or from that "nest of spicery," the Iowa Agricultural College farm at Ames.

PLUM CULTURE.

Plum culture we know nothing of in Minnesota except as to the Illinois, Iowa, and Wisconsin natives, like the Forest Garden, the Weaver, the De Soto, and many nice sorts selected from our

native Minnesota groves. But the growing of these native sorts I have mentioned is successful and profitable. They are of fair quality for eating out of hand and good for cooking. They are large, handsome and sell well in market. The Forest Garden is earliest but will not bear much handling or transportation, unless with extreme care, it is so tender in skin and pulp. The Weaver and De Soto are firm. These two resist the Little Turk, and for some reason he does not seem to get hold of the Forest Garden where I have seen it grown. Perhaps he may under other conditions. These varieties are all perfectly hardy. Opinions differ, but I consider the De Soto the most reliable for a crop and the most profitable. There are others highly recommended, but I am not acquainted with them.

SMALL FRUITS.

As to small fruits little need be said. From the currant to the grape they are nearly all at home in Minnesota, only that some of them entail more labor on the grower in their needs for winter protection. Aside from this, the manual of small fruit culture is the same for Minnesota as elsewhere in the north. We think our climate, or our climate and soil together, produces better outdoor market grapes than can be grown in the East or further down the Mississippi valley. We see of no other growing as handsome Concords or as good Delawares. The river bluff region at St. Paul and below, and the lands around Lake Minnetonka at present produce the finest. Whether our success in grapes is due to soil or air, or to our short, hot summers, or all combined, I cannot say. Our growers have lost but one crop of grapes by frost in twenty years.

AWARDS TO MINNESOTA IN 1883.

On the 13th of September last, at Philadelphia, the American Pomological Society awarded to Minnesota the Wilder silver medal on its collection of apples, and grapes, there being but four medals awarded on the entire exhibition of fruits. On the same day the Pennsylvania Horticultural Society, having all the exhibits of both societies before them, awarded us the second premium on best twenty varieties of grapes in cut bunches.

AMERICAN POMOLOGICAL SOCIETY IN 1885.

Members of the Mississippi Valley Horticultural Society from other states: We hope to meet you in Michigan in 1885. We acknowledge your supremacy in oranges, peaches, pears and plums; in some states in the extension of the number of varieties of profitable apples; in others in the production of winter apples; but when this venerable umpire and patron comes to consider the greatest beauty and quality combined of which the apple is capable, and the character of our outdoor grapes, we may claim the medal again. But the rivalry shall be generous as it is in all strictly horticultural exhibitions; and whoever wins, the defeated party shall lead the other out for the applause at the footlights before the curtain, and help bestow the wreath of bays.

[From the banquet at the Green Bay Meeting of the Wisconsin Horticultural Society, in reply to the Following Toast:]

"DOES THE FLOWER GARDEN PAY?"

My wife, who keeps the statistics in our family, notified me last fall that the clock which tells the years for us had struck fifty-one for the ostensible head of the establishment; and now, as I am on the shady side of life, it is realized more clearly than ever before, that there are some employments for us in this world that pay tolerably well, and yet whose remuneration may not be accompanied by the crinkle of greenbacks or the clink of specie: and of all the branches of horticulture that pay us in the pleasures they afford, and in the good they enable us to do, I take the affirmative on the proposition that the flower garden rather has the lead.

You who do not grow flowers, think you love and admire them. Probably you do; I guess everybody loves flowers. But you can never begin to imagine how much pleasure they can confer till you come to have a flower garden, and tend it with your own hands.

The flower garden pays especially well in its influence upon children in the family. Whatever fixes the attention or engages the affections of the young, either elevates or debases them. When they take to flowers, who ever thought of a bad influence from it? Flowers are as good medicine for the mind as fruits are wholesome for the body.

My wife and I have brought up a family of girls and a single boy. I do not speak here to advertise the girls for the matrimonial market; for all but one are gone, and we do not want any one to come after her. But I was thinking when the toast was given me, how much good the rose-garden at our house has done the girls and their associates. How convenient it has been when the young gentlemen from other wigwams were hanging around, and the old folks in the way, for the girls to help the cads out of their embarrassment by saying, "come out and see the roses, Jo," or words to that effect; and as my wife and I have sat on the front porch, and watched the evening shadows chase the retreating sunshine up the eastward bluffs, across the lake, we have thought that there were lessons in horticulture being taught the boys out there among the roses what would be of some use to them by and by when their wives want a man to handle the old briars, or dig in the rose-garden, or foot the bills for a reasonable supply of seeds or plants for house or garden. Who could refuse, remembering the flower garden of young love's dream. We may have thought, too, that the girl who gives a young gentleman such lessons in horticulture, and who pins a flower upon his coat, or places a boquet in his hands, as she bids him good night over the front gate, does her part to make a husband for somebody who will be more of the lover in married life for it, and who will find flowers in his home that will be more attractive for his evening or other leisure hours than society at the clubs or the cross-roads' groceries, and who will treat his wife maybe as "the most splendid flower" of all.

I remarked that we have but one boy in the family. At present he is not much of a horticulturist. If he follows the plow with any pleasure it is when it is returning from the field, or when some neighbor has borrowed it and is taking it off the premises, or when it is badly crippled and going to the blacksmith shop. He does not feel the need of exercise in the garden. He loveth not the hoe, and the dibble is an abomination. Also the spade. And he would actually rather go without his strawberries than to pick them for himself. Yet with all this there is hope for even him. He may be eminent in horticulture some day; for after his mother has bossed the job, and I have done the work to grow a few choice free blooming roses, we notice now that when he comes home from the shop, and fixes himself up for his evening walk, he too goes round the corner of the house to the flower garden and cuts a bloom of something for his coat collar and liberally helps himself to enough

of the pink moss roses to stock a graded school graduation; and when his mother watches him crossing the lawn towards the city, she knows those flowers are not going to the beer saloon or the billiard hall, and she knows too that they will carry a silent message to some other mother that says, we can trust our children when they wear the badge or carry the tokens, or study together the lessons of the flowers.

How often a timely gift of flowers pays us for our labor in growing them! How delicately can we confer a favor or repay an obligation in this way, and how many fine lessons can be impressed by flowers! One day last summer I saw a railroad conductor, a young man, new on the road, interfere to protect a passenger from the insolence of a baggage-master. The next trip he made through our town, he found awaiting him at the station the best bouquet the place afforded, indorsed "with the compliments of Lake City for politeness to passengers." When that bouquet went home to his mother, sister, wife or sweetheart—which of course it did—while the givers reflected how it paid them to grow flowers, I dare say the conductor was thinking and would never forget that it paid to exercise common sense and politeness in the management of a railroad train.

The flower garden pays in the aid it gives us in the regulation of our lives. There are no creeds here to fetter the mind—no conventionalities to hinder our study into the laws of life. When we study the organs and the growth of plants and flowers we are led directly and irresistibly to apply the knowledge we gain by analogy to ourselves as only higher forms of life; and seeing one great law of improvement or degradation governing all, we learn to reverence the provisions that nature makes for man to work out his own relief, and to understand that there is no escape from the dreadful consequences of inattention to or violation of natural law, either for ourselves or our posterity.

We now understand as pomologists that the fundamental condition of success is a knowledge of fruit blossoms. Let us note and give due credit to the fact that all or nearly all our advancement here, has had its beginning in the work of florists in the study of the nature and uses of the organs of flowers; and here we find that the flower garden has paid us as the greatest promoter of our art.

ACKNOWLEDGMENT TO PROF. BEAL.

The Secretary is under obligations to Prof. Wm. J. Beal, Lansing, Michigan, Secretary of the American Pomological Society, for advance sheets of his report of proceedings of the meeting of that society held in Philadelphia last September. This makes it possible to publish in our report of 1884, many useful extracts that ordinarily could only appear a year later.

NOTES AND EXTRACTS

FROM THE AMERICAN POMOLOGICAL REPORT
19TH BIENNIAL MEETING, 1883.

IMPROVEMENT OF FRUIT BY SEED PLANTING.

President Wilder. "Thus would I preach while life shall last; Plant the most mature and perfect seeds, of the most hardy, vigorous and valuable varieties of fruits, and as a shorter process, insuring more certain and happy results, cross and hybridize our finest kinds, for still greater excellence."

QUALITY AND HARDINESS IN SEEDLINGS.

Dr. E. Lewis Sturtevant, Geneva, N. Y. To improve the *quality* of fruit, select seed from fruit containing less seed than the average for its kind. Cross-fertilize small or few-seeding varieties with pollen from varieties of the same or similar habit as to seed, and from the produce select the few seeded specimens for continuous plantings. Continue this kind of selections through succeeding generations of seedlings. These suggestions of Dr. Sturtevant are based on facts in his experiments at the New York farm at Geneva, indicating that quality in fruit improves by the care of man in fruit trees and plants in proportion to the decrease of seeds.

A row of strawberry plants raised from seed that were showed me by Dr. Sturtevant, exhibited facts in this direction. Taking the same variety of berries—if I remember rightly, the Wilson, he set for the first hill a seedling plant raised from a berry containing the largest number of perfect seeds; the next hill, the next largest, the next, the next, and so on till the last hill, which was from the

fewest seeded berry. On fruiting the row, this last hill gave the best flavored berries of all. This was in 1883. Further results from the same row, as to productiveness and quality, vigor and habits of the plants, comparatively, will be interesting.

The reason suggested by Dr. Sturtevant for this apparent rule of reproduction, is that nature, under the care of man, is relieved in part from the necessity of exerting her powers to protect and preserve the plant in the natural war of races and individuals, wherein only the fittest survive; and the reproductive instinct lessening or sleeping under this case, the improvement of conditions in cultivation, goes to the pulp or receptacle of the seeds and enhances the quality. This is not the Doctor's language, but "for short" is believed to be his idea.

To improve the *hardiness*, therefore, the rule of selection of seeds would be the reverse; that is, take the many or plump seeded kinds, and so on from generation to generation. G.

ENCOURAGEMENT OF BETTER QUALITY IN FRUITS—POMOLOGY IN PUBLIC SCHOOLS.

President T. T. Lyon, South Haven, Mich. Trees of varieties of fruit of high quality, being usually poor growers, should be catalogued by nurserymen at higher prices.

And while legislators are moving in the effort to provide for the instruction of children in our common schools respecting the injurious effects of alcoholic beverages upon the human system, may it not be altogether wise and proper that we, sustained as we will be by the deductions of the medical fraternity, present as nature's favorite preventive, if not her *antidote* for this sovereign evil, the free and abundant use of ripe fruits, and to urge at the same time as a most effective means of accomplishing this object, the teaching in our common schools, as well as in higher institutions of learning, the fundamental principles of pomology, including the origination, care and management of trees and plants.

STRAWBERRIES.

Under this head are selected only the points in discussion thought to be of most practical value to Minnesota. The facts given in respect to influence of pollen are given in another article.

Black Defiance. James Wood, of New York. It is a superb family berry, but is rather difficult to grow. This does not deter the true amateur, when the highest quality rewards his efforts.

E. Moody, Lockport, N. Y. It is good with good care.

Cumberland Triumph. E. H. Bissell, of Virginia. It is steadily and rapidly growing in favor. The plant is vigorous, productive and profitable to the grower.

G. W. Campbell, of Ohio. Foliage healthy, bears well, and fruit is of good form and handsome in color and averages large.

J. B. Rogers, of New Jersey. With me it is good to fertilize the flowers of the Manchester.

T. T. Lyon, of Michigan. It lacks firmness, [plant some firm staminate near it to correct this deficiency] but is superior for amateur purposes.

E. Williams, of New Jersey. It is one of the best for family use.

S. Johnson of Indiana. Two stars for Indiana.

Great American. On a motion to strike it off, E Williams of New Jersey said no berry had borne so well as this one in certain locations.

C. M. Augur, of Connecticut. I saw in June last at, Hilton, New Jersey, one acre and eight and a half rods, that yielded a return of \$1803, or fourteen cents per quart gross. This I think the largest on record. A berry capable of that ought not to be taken off the list. It needs heavy soil, thorough manuring, and plants set in single rows, with good cultivation. Neglected, on a light soil, it is of little value.

J. B. Rogers, of New Jersey. Averages thirty-six to the quart. The ground must be firm, and not disturbed deeply, while the plants should be renewed yearly.

Jersey Queen. Contradictory reports of this berry, but the weight of testimony was in its favor for heavy soils and with good fertilizing from staminate sorts.

P. M. Augur spoke of samples weighing two and three-fourths ounces each.

A. J. Caywood of New York. It has beaten the Manchester, Seneca Queen and some thirty other varieties which we fruited. Although the Seneca and Manchester are heavy bearers, this trio, with Seneca Queen to fertilize the other two, are in my opinion the best of the new ones at present.

Miner's Great Prolific. Strongly recommended by T. T. Lyon, of Michigan, S. Johnson of Indiana, R. H. Haines of New Jersey, J. H. Bourne of Rhode Island, and J. H. Hale of Connecticut.

Seneca Queen. P. M. Augur. Good in Connecticut.

T. T. Lyon, of Michigan. One of the most beautiful and productive of dessert sorts, but lacks firmness for the market. [Give it a firm staminate companion for a fertilizer.]

Sharpless. Indorsed very strongly, perhaps more so than any other berry spoken of at this meeting. Testimony unanimous in its favor, generally placing it at the head of the list.

Donner's Prolific. Restored to the list and starred for Minnesota on statement of its value there for sandy soils.

Manchester. J. H. Hale, of Connecticut. Has now fruited with us three years, and stands without a rival for productiveness, uniform large size, and perfect form of fruit; pale, scarlet color; moderately firm and good quality; ripens medium to late. In planting for profit next season, 90 per cent of our planting will be of the Manchester.

For other remarks about the Manchester strawberry, see article on "Immediate Influence of Pollen."

James Vick. C. A. Green, of New York. This has proved the most prolific of all with us, and appears to be blight proof.

Mr. Bassett, of New Jersey. The foliage resembles the Cumberland Triumph, and it is perfectly healthy.

Dr. S. Hape, of Georgia. I have given it a severe test at Atlanta, and it is very promising.

W. C. Strong, of Massachusetts. Its growth is all that could be desired.

Dr. F. M. Hexamer, of New York. The berries are similar in general appearance to Capt. Jack, but larger, of better quality, handsome and very firm, suitable for shipping great distances. Its yield in number of berries is simply enormous; and if all that set are allowed to remain, many will naturally be small; but if a judicious system of thinning out were practiced, the main crop would be of good marketable size.

G. W. Campbell, of Ohio. Not fruited with me yet, but the vigor of the plant and the health of foliage is very satisfactory.

J. H. Hale, of Connecticut. The foliage is strong and heavy. The berries rather small, but uniform; quality good; ships well.

E. Williams, of New Jersey. I regard it as a healthy, promising sort.

J. S. Collins, of New Jersey. Heavy foliage; productive; berries firm, but not of large size.

Oliver Gibbs, Jr., of Minnesota. Not fruited yet in our State, but is promising well. F. G. Gould, of Excelsior, one of our best

judges of plants, predicts that this is one of the new sorts that have come to stay.

George Balderston, of Maryland. It is a vigorous and healthy grower, but what surprised me was the great quantity of roots each plant possesses—more than on any other variety I ever handled. I have not tested the fruit.

P. M. Augur, of Connecticut. Whoever plants it must understand that good feeding must be given any variety that is as prolific as the James Vick.

Atlantic. Dr. F. M. Hexamer, of New York, spoke of extraordinary crops of this new variety being grown on the sands of New Jersey.

Hart's Minnesota. J. H. Hale said of this that is very fair, of a glossy color, early,—a good amateur berry.

Mt. Vernon. E. Satterthwait, of Pennsylvania. I fruited this year for the first time about two acres of this variety, and it proved to be the most profitable of about a dozen of the best sorts, including the Sharpless. It is late, good size, the right color for market, sufficiently firm and very productive.

Oliver Gibbs, Jr., of Minnesota. I have kept careful watch of the new sorts fruiting in Minnesota this year, and this is the only one of them I have cared to add to my list.

P. M. Augur. It is a good fertilizer for other late sorts.

Prof. Beal publishes in the report the following table from the *Rural New Yorker*, showing the preferences of its readers for twenty varieties of strawberries, according to their answers to an inquiry for a statement of their choice:

Crescent.....	45	Glendale.....	10
Wilson.....	37	Captain Jack....	9
Downing.....	30	Windsor Chief....	7
Sharpless.....	27	Green Prolific....	7
Manchester.....	23	Duchess.....	5
Kentucky.....	23	Jersey Queen.....	5
Cumberland..	22	Downer's Prolific.....	4
Bidwell.....	15	James Vick.....	4
Miner's Prolific.....	14	Jucunda.....	3
Mt. Vernon.....	12	Crystal City.....	3

CURRENTS.

Fay's Prolific. J. T. Lovett, of Little Silver, New Jersey. This is a signal success in our State, fulfilling well the claims made for it.

C. A. Green, of Rochester, N. Y. It is vigorous and productive, and appears to be an improvement over any variety we have.

J. B. Rogers, of New Jersey. From the limited experience had with this variety, the indications are that it is the most prolific of all the currants. It will be planted extensively the coming season.

J. S. Collins, of New Jersey. It is a strong, healthy grower, productive, very large and of good quality.

Lee's Prolific. J. W. Manning, of Reading, Mass. It is a strong grower. The wood as well as the fruit possesses a very high aroma. The berry is large, and the fruit abundant. It is a new black sort, which may excel the Black Naples.

GOOSEBERRIES.

Houghton and *Mountain* were recommended by several speakers, S. Johnson, of Irvington, Indiana, speaking of the *Mountain* as a high bush variety.

Orange. This was recommended by H. M. Engle, of Pennsylvania, as a good early gooseberry.

Smith's Improved. J. W. Manning. We named it Smith's Seedling when we introduced it in 1864. Dr. Smith, of Windsor, Vermont, raised it from the seed of the *Houghton*. H. E. Hooker, of Rochester, New York, we suppose, changed its name to Smith's Improved. It is one of the best gooseberries in cultivation. No one comes before the Massachusetts Horticultural Society so uniformly fine as this.

Foreign Gooseberries. Objection being made to allowing any of these sorts on the list on account of their tendency to mildew —

Thomas Meehan, of Philadelphia, said they were valuable with skillful treatment in certain places.

J. W. Manning. Foreign gooseberries are not to be discarded. They require special treatment. I have seen fine crops growing on the place of A. Hammond, at Seneca, New York. He attended to his plants every day, cutting out old wood, letting in the sunlight, and mulching with green grass. I once saw a successful plantation in Jersey City. They need much care and the right treatment to prevent attacks of mildew.

RASPBERRIES.

Clark. A. J. Caywood, of New York. One of the best family berries we have.

Cuthbert. Vice-President Berckmans, of Georgia. The introduction of the *Cuthbert* has been a good thing for Georgia. It will keep several days after shipment, and then bring a high price

in market. Also strongly recommended as the best late raspberry for the market and for the table by E. H. Bissell, J. H. Hale, H. M. Engle, J. S. Collins and W. C. Strong.

Herstine. W. C. Strong. Excellent for family use.

Gregg. S. Johnson, of Indiana. There is but one voice in Indiana in regard to the Gregg. As a black-cap it is about as near perfection as is likely to be reached.

W. C. Strong. The most desirable of the blackcaps.

J. H. Hale. The largest black-cap we have, ripening too late to command a high price in market; yet it is very valuable for family use.

J. T. Lovett. Requires a heavy soil and high culture; then large, productive and very fine.

Purple Cane. Thomas Meehan of Philadelphia. An old and strong hardy sort. Should be retained to raise seedlings, if for no other purpose.

Reliance. A great improvement over its parent the Philadelphia, which it resembles in color. Next to Cuthbert. The most reliable sort we have for family use.

Souhegan. J. H. Hale, of South Glastonberry, Connecticut. We have tested the Souhegan now for four years, and find it to ripen from four to six days earlier than the Doolittle. The plant is vigorous and very prolific, fruit jet black, rich and sweet; very profitable for market, and one of the best for family use.

Robert Manning. Two stars for Massachusetts.

J. T. Lovett, of Little Silver New Jersey. I consider it of great excellence and value, ripening as it does very early. It is enormously productive, free from bloom, and by long odds the best early black raspberry we have. With this and the Gregg for late we have little use for any other black cap, either for table use or for the market.

Hansell. J. S. Collins. It is a very good, new, early berry for shipment.

J. H. Hale. It stands the drouth and the heat well; a very promising early sort.

C. A. Green. It is a moderate grower, rather firm, of good color and fair size.

Howard A. Chase, of Philadelphia. The Hansell is a chance seedling that has been fruited by the originators, in Burlington county, New Jersey, for six or seven years. They have tested it beside the Brandywine, and it has proved to be hardier, more productive, as good a shipper, of better quality, and from a week to

ten days earlier than that berry. It is undoubtedly the earliest ripening red raspberry now grown. The originators have increased their plantation as rapidly as they could produce the plants, now having about ten acres in fruiting, and have entirely ceased planting the Brandywine.

Marlboro. C. A. Green, of New York. It is large, bright red, firm, of good quality, very early and a vigorous grower, evidently a heavy yielder.

J. H. Hale, of Connecticut. It is a strong, vigorous plant, fruit of largest size, bright color and very firm. It ripens extremely early. It is much like Brandywine in flavor, gives promise of being the early market berry of the near future.

T. T. Lyon, of Michigan. I saw the plant in New Jersey. It is certainly a very vigorous variety.

J. S. Collins, of New Jersey. The canes are growing very healthy and strong in New Jersey.

J. H. Hale, of Connecticut. The Marlboro is a large and fine early sort.

Reader. T. T. Lyon, of Michigan. It is good in West Michigan for Chicago market. It is of fine quality and bright color.

Shaffer's Colossal. W. C. Strong. The black caps are little cultivated and not wanted in our markets. This one is remarkably vigorous, fruit large, dull red and of inferior quality. It may be valuable for canning—bottling, I should say, for such fruit should always be put in glass jars.

T. T. Lyon. It is the strongest tip-rooting variety I know. It ripens its fruit in succession, and often produces a fine crop on the new canes, from tips of the previous spring planting. Fruit not of an acceptable color for market. I should think best to omit the word "Colossal" and call it "Shaffer."

J. Saul, of District of Columbia. It is one of the best of its class; it is not fit for market, however.

Dr. S. Hape, of Georgia, finds they sell readily in market and are considered very valuable generally; a little sour, but excellent with plenty of sugar; superior for canning; very productive.

J. H. Hale. An improvement on the Catawissa and New Rochelle. Fruit of largest size, but of dull red color that will not sell well in market; valuable for canning.

Parker Earle, of Illinois. I can say this for the Shaffer, that the fruit is of excellent quality for the table, for all people preferring an acid raspberry. I find that at my own table it is taken in preference to the Turner, which I esteem the richest and best of

all raspberries. For canning it has very great merit; and while its wretched purple color will forever debar it from all markets where whimsical prejudices about color and total disregard of eating quality seem to determine all values, yet the Shaffer must be regarded as a very valuable addition to our list of raspberries.

G. W. Campbell agrees with Mr. Earle.

C. A. Green. It will yield twice as much as any other red raspberry that we have seen; fruit of the largest size, color dark purple, the best for canning, and meets with ready sale in ordinary markets; not suitable for fancy markets. The most vigorous of all in growth.

J. T. Lovett. The strongest growing and the most prolific of any raspberry that I have yet grown. The fruit is of colossal size, in truth as well as in name, and although rather tart to suit most tastes, yet it is sprightly, and to my liking. Its color is so dull and unattractive that it does not meet with a ready sale in market. I have found it the best of all berries for canning.

Prof. Beal also publishes the votes of correspondents of the *Rural New Yorker* on raspberries, as follows:

Cuthbert.....	32	Gregg.....	32
Turner.....	20	Mammoth Cluster.....	13
Doolittle.....	11	Souhegan.....	10
Tyler.....	7	Caroline.....	7
Philadelphia.....	5	Hansell.....	4
Clark.....	4	Davison's Thornless.....	4
Highland Hardy.....	3	Shaffer.....	3
Brandywine.....	3	Early Prolific.....	3
Lost Rubies.....	2	Ohio Black Cap.....	2
Montclair.....	1	New Rochelle.....	1

BLACKBERRIES.

Nothing in the discussions about blackberries of apparent value to Minnesota, except what has been already stated elsewhere in the Minnesota report as to the Snyder and Stone's Hardy.

GRAPES.

There was a longer and more animated discussion on grapes than on any other class of fruits; in fact, the grape fever seemed to run high among the representatives of most all sections of the country. Many new sorts were exhibited. Among these was the Jefferson, resembling the Delaware, but the bunch more shouldered and the grapes larger. It is rather late; said to be a seedling of Con-

cord, fertilized by Iona. Quality excellent. Worthy of trial in Minnesota. If it will ripen here it may prove of value.

T. S. Hubbard, of Fredonia, New York, J. Saul, of Washington, Dr. S. Hape, of Georgia, H. M. Engle, of Pennsylvania, W. C. Strong, of Massachusetts, and G. W. Campbell, of Ohio, all spoke well of it.

Lady. E. H. Bissell. It has fruited this year at Richmond. As compared with Concord, it has been as vigorous and productive, Both foliage and fruit have been free from disease or blemish. A promising variety.

J. Saul. I consider it one of the very best early grapes. It is rich in color, with a delicious flavor.

J. H. Hale. It is a valuable early sort for family use.

J. B. Rogers. In New Jersey it makes four clusters, many small berries, and is very thin in the bunch.

E. Williams. It is liable to rot.

Lady Washington. S. Hape. It is quite successful in Georgia.

J. Saul. It is an excellent grape and promises well in the District of Columbia.

Moore's Early. R. H. Haines. Give it one star for New Jersey.

J. T. Lovett, of New Jersey. It is equal to Concord in all respects, unless it be that it is not so productive—it indicating a tendency in that direction with me. I think it rather better in quality, and it ripens nearly two weeks in advance of the Concord. Give it two stars.

T. T. Lyon, of Michigan. It is considerably planted in Michigan, and highly esteemed as the most promising very early grape for general planting.

T. S. Hubbard, of New York. It ripens with us only about a week ahead of the Concord, and about with the Champion. Grows only fair clusters, not uniformly as large as Concord, though berries are larger. Quality about the same as Concord.

G. W. Campbell, of Ohio. It is best described as an early Concord, with clusters smaller and berries larger.

Pocklington. The reports on this variety were contradictory, but the weight of evidence was against it, as being ten days later than Concord.

Worden. Vice President Berckmans. It is earlier and better than the Concord in Georgia.

T. T. Lyon, of Michigan. It is becoming more and more popular in Michigan, and deserves one star.

G. W. Campbell. It has not done very well this season, but is generally good and reliable. A week earlier than the Concord, with larger clusters, and rather better flavor. Increasing in favor. I think it should have two stars for Ohio.

John S. ul. Give it one star for the District of Columbia.

F. M. Marble, of Massachusetts. Very good with us, ripening when others fail.

J. H. Hale. All things considered, I think this the most reliable black grape we have. Two stars.

J. B. Rogers. Better than the Concord in flavor and size. Rapidly coming into favor. Give it two stars for New Jersey.

T. S. Hubbard. With us it ripens only two or three days before the Concord. Is gaining in popular favor.

Eldorado. J. T. Lovett, of New Jersey. Taking into consideration superior quality of fruit, beauty and excellence of vine, I would place it first among the best of white grapes, either new or old. I fear that its value is not appreciated.

THE PHYLLOXERA.

Wm. Saunders, of Washington. I should like to inquire of cultivators in reference to the injury from this insect.

G. W. Campbell, of Ohio. My vines were troubled with it a good deal a few years ago. Lately the insects have become quite scarce in our locality.

THE MILDEW.

Mr. Saunders. Our native grapes are destroyed by winter frosts because they have been subjected to mildew in summer, and it is only in special localities where all kinds grow well. The most generally cultivated grapes are confessedly not those of the best quality either for table use or for wine. No one would grow very largely of Concord, Ives, Martha, or Hartford Prolific, if they could with equal certainty secure regularly good crops of Ionia, Eumelan, Delaware, Walter, Diana, Catawba, or Brighton. The best grape climates are those where there are least dews, and wherever we find specially favored localities, we will find this partial or total exemption from heavy dews. This has long ago been demonstrated, and new grapes emanating from favored regions will fail to give entire satisfaction when grown in localities less favorably situated, and thus lead to disappointment. This is the reason for so many

seemingly conflicting opinions regarding the merits of varieties, and it is unfortunate that these considerations are not better understood and recognized. When a young grape vine loses its foliage by midsummer, and the green shoots remain unmaturing till frost, that variety might as well be discarded at once; no known methods of pruning, fertilizing, or care in cultivation will help it. The only known remedy is shelter, arranged so as to arrest radiation of heat from the foliage during nights.

Among the more recently introduced varieties, the Bacchus, Lady, Pocklington, Moore's Early, and Noah will probably succeed well wherever the season is long enough to ripen the fruit. Brighton, Duchess, and Prentiss will require specially favorable localities for their perfection. Thus it is that the best flavored and most desirable varieties are not always the most reliable.

APPLES.

The discussion on apples was mostly confined to varieties of little account in the Northwest. A call being made for a report on the Minnesota collection,

Oliver Gibbs, Jr., of Minnesota said: I can gratify my own constituents, and perhaps add a little to the stock of knowledge here by a few remarks about the three varieties of apples, samples of which I show you here on these plates.

Vice President Berckmans, of Georgia. We shall be very glad to hear about them.

Secretary Beal, of Michigan. Yes, and we want to hear more and more from Minnesota.

Oliver Gibbs, Jr. You all know the Duchess of Oldenburg. It is a universal success in the North, and doing better in the Northwest than anywhere else. You have seen it in the Minnesota collection and admired its beauty.

But here is the Wealthy, a seedling of our own, which is said to be worth a million of dollars to our State, and this I wish to give a little more prominence on your records. The specimens here do not show the beautiful color and finish that belong to the Wealthy as they wanted a few weeks' more growth and sunshine to mature them. When ripe the Wealthy is a bright red, with usually a delicate light blush on one side. You see its size is medium to large, and its shape is just perfect. With us an ill-shaped or ill-looking Wealthy is never seen, and we have already hundreds of bushels in single orchards. These samples were picked from an orchard of

2500 bearing trees of the Wealthy. The texture is tender inside, although the skin is such that it will bear handling, like the Jonathan, and its waxy finish, when ripe, protects it from evaporation from within and penetration of the air from without. The flavor is a slightly sub-acid, with a vinous quality. In fact, it is a better dessert fruit than the Fameuse, and belongs to the digestible class of apples. In the Northwest its season is ordinarily late fall or early winter, although Dr. Hoskins, of Northern Vermont, classes it there as a winter apple with the Baldwin. It stays mellow a long time like the Seek no further, before commencing to decay or lose its quality, but does not have any tendency to wilt. The tree is not quite so hardy as the Duchess, its weakness being a tendency to get injured on the stem while young. This can be overcome by boxing. It ripens up its wood early in the fall. Our coldest and most sudden winters never catch it unprepared, and we can grow it perfectly as far North as the 46th parallel, and how much farther we do not know.

It is a very early, an annual, and an abundant bearer. This variety was originated by Peter M. Gideon, of Excelsior, Hennepin county, Minnesota, at Lake Minnetonka, about twenty years ago. The seed was sent him by Albert Emerson, of Bangor, Maine. Mr. Gideon thinks the seed that of Cherry crab. Professor Budd, of Iowa, however, classes it as a Russian, from the characteristics of leaf and bud, of the Astrachanica form, a straggler in heredity perhaps by way of a cross, from some importation through New Brunswick or Canada to Maine, and thence to Minnesota; as our Duchess was from France to America after Andrew Knight brought it from Simbirsk to England as the Borovinka and let it go over to the French for trial, where a new name was given it. It is a boon to the Northwest, and doubtless has value to the entire North, for so far as tested in several states it appears to be of general adaptation.

The State of Minnesota gives Mr. Gideon a thousand dollars a year and the use of a farm on Lake Minnetonka, to continue experiments in fruit raising in his own way, without interference, asking only that he report once a year to the Board of Regents of the State University.

This other large, smooth apple is the Yellow Transparent, one of the Russians of the Agricultural Department importature. It is of good dessert and cooking quality, season earlier than the Duchess; a reliable and abundant cropper.

Mr. A. G. Tuttle, of Baraboo, Wisconsin, is experimenting largely with the Russians, and says that since he has fruited this he has no further use for the Tetofski. The Yellow Transparent does well so far in Minnesota, and I would recommend it there for general trial, though possibly we may want a hardier Russian for the north part of the State.

This red undersized apple is the best of all the crabs—the Whitney No. 20. It is good for hand eating, and almost as good as the peach for canning, and is pronounced by experts as the best apple to sell to the driers yet known, as it needs no paring, has just the right proportions of acid and sugar and the right texture, and only needs to be cored and cut in two to prepare it for use. The tree is a perfect beauty; stem straight as a gun barrel, top of a peculiar curved upright growth, unlike anything else in our orchard list. When you see a tree of Whitney No. 20, you always recognize it at a glance from the clear individuality of its expression. It was originated by A. R. Whitney, of Franklin Grove, Illinois. Its parentage is unknown to me, but Professor Budd classes it, by its habits of growth and its thick pubescent leaves, with the Russian Astrachanicas. I do not know but that on his theory of adaptation, he will yet prove all of our successful sorts in the Northwest to be of that class.

We have other very interesting varieties of the apple, but as these are the best of the newer ones that have been well and generally tested, I will not take up your time further.

CRAB APPLES.

J. A. Root, of New York. People have just begun to appreciate the different varieties of the Crab. They are rich in flavor, excellent for jelly or pickling, canning, for making apple butter, and, for evaporating, if simply cut once in two and dried, they make a third more pounds of evaporated fruit. They bring double the price of ordinary evaporated chopped apples. The trees are very hardy and prolific. This year the crabs have produced a good, full crop, while all other varieties of apples are very scarce.

Whitney No. 20. J. W. Manning of Massachusetts. This is a very handsome grower; a most desirable variety, and a substitute for all others in its season.

PARAGRAPHS FROM C. A. GREEN.

UNCERTAINTIES.

The astonishing quantity of fruit a community, whether rich or poor, can be educated to buy and eat.

Whether new varieties of fruit approaching the ideal in one direction tend to weakness or defects in another.

Whether the fruit or the seed is the primary object of nature. The protection, development, and dissemination of the seeds would appear to be the primary object, the edible qualities aiding in the distribution of the seeds.

The cause of occasional late strawberry blossoms being pistillate on hermaphrodite plants. Where strawberries do not perfect all their fruit this may often be found to be the cause.

The cause of the occasional destruction of fruit germs after blossoming, in the apple and pear.

Why seedlings are apt to succeed best where they originate. We might suppose the survival of the fittest a cause. If one had sown eastern apple seed in Dakota and one survived, it might be expected to be the hardiest that germinated. If we had sown apple seed produced from Dakota trees we should have hoped to have been more successful, expecting that the Dakota grown seed would inherit and tend to perpetuate characteristics produced by their parent's struggling with the great severity of the climate. Professor Beal has shown how the vital forces of trees are thrown to the points bearing the greatest strain or hardship, citing the strength of branches that buffet every wind. This accidental characteristic might be utilized in producing hardier varieties.

CERTAINTIES.

That our occupation is healthful not only to us who pursue it, but in its effects on those who consume our product. Fruit growers do more to bankrupt the grave-digger than doctors.

If we find birds no larger than our thumb struggling with destructive worms in our nurseries we need no prophet to assure us that they are friends as well as our morning and evening serenaders.

That if we apply fertilizers to plants, vines and trees, indiscriminately we are in the position of the farmer who feeds his cattle without observing their likes or dislikes—their wants and abhorrences.

That one of the most significant evidences we have that the interests of fruit growing are alive and advancing, is that the veterans who went forth like John the Baptist proclaiming a new dispensation, the men who laid foundations, whose zeal gleamed brightly, and whose enthusiasm was kindled before many of us were born, are appreciated and honored. Let ill-health or accident befall one of them and expressions of sympathy come from every press in the land. The memory of these forerunners will be indelibly impressed upon us. They will live to see their best hopes realized; the men of the future will point to them as benefactors, and their names will be written in letters of gold by those who follow in their great work.

REPORT OF COMMITTEE ON RESOLUTIONS.

Mr. President and Members of the American Pomological Society:

GENTLEMEN: From the great variety of things that have contributed to the enjoyment of this nineteenth session of our society, and from among those who have by their activity, thoughtfulness, and hospitality added to the success and general happiness of this reunion, it is difficult to select that which should most appropriately be embodied in our closing resolutions. Your committee would like to go into details, mentioning a great many things that seem especially meritorious as matters that should have a permanent place in the report.

The fact is that the display of horticultural progress and taste in the magnificent exhibition of horticultural products, and floral arrangements by the people of Philadelphia and vicinity; the cordial reception and open-handed generosity with which we have been received, and the general air of hospitality that we have been breathing, have captured your committee, and we feel that nothing short of an illustrated volume would do justice to it all.

In view of this we have contented ourselves with the submission for your action the briefest epitome of what could be appropriately said, in the following resolutions:

Resolved, That the hearty thanks of our society be and are hereby extended to the officers and members of the Pennsylvania Horticultural Society for the hospitality with which we have been received and entertained, and especially for the complete arrangements of the halls of exhibition, and the magnificent display of horticultural products by means of which we have obtained a glimpse of the taste and methods which form the basis of the wide reputation which Philadelphia has for being a city of beautiful homes.

Resolved, That the thanks of the society be extended to the officers of the Building Commission, Fairmount Park, Academy of Fine Arts, Academy of Natural Sciences, Union League, Zoological Gardens, and Girard College, for especial courtesies extended to our members.

Resolved, That we heartily appreciate the deep interest in the welfare of our society, and whole-souled generosity shown in the most substantial manner, which designates our President, Marshall P. Wilder, as the right man in the right place; that we regret most sincerely the disability which deprives us of his presence at this meeting, and extend to him our sympathy and hearty good wishes.

Resolved, That in the absence of our worthy past First Vice President, P. Barry, we miss one who has contributed very largely to the success of our society, and we regret the decision that he has made which takes him from the active positions of work which he has so faithfully and ably filled. We shall still expect for many years to feel the impulse of his presence at our meetings.

Resolved, That the secretary of this association be authorized to issue an address to the various societies organized in the interest of horticultural and pomology in this country, declaring the purposes and work of our American Society, and epitomizing the advantages of membership therein, requesting that such societies make some leading officers members, thus securing the biennial publications for their permanent library use.

CHARLES W. GARFIELD, Michigan,
P. M. AUGUR, Connecticut,
T. V. MUNSON, Texas,

Committee.

OTHER RESOLUTIONS ADOPTED.

Resolved, That the withholding of new and valuable fruits from the general public, or placing them under close restrictions for an unreasonably long period is contrary to the spirit of true philanthropy and the genius of this association.

Resolved, That this society will not discuss the merits of any new fruits held under restriction upon their sale for individual advantage.

*THE BANQUET AT THE UNION LEAGUE CLUB,
FRIDAY EVENING, SEPT. 14.*

SECRETARY BEAL'S REPORT.

The nineteenth biennial session of the American Pomological Society terminated on Friday evening with a banquet, tendered by the Pennsylvania Horticultural Society. At one end of the main hall a platform was constructed upon which was placed a large table in the form of a horseshoe. Long tables occupied the main floor.

Soon after seven o'clock Hon. W. L. Schaffer, President of the Pennsylvania Horticultural Society, was seated at the head of the table, at the right of whom was Hon. P. J. Berckmans, First Vice President of the American Pomological Society. The speakers of the evening and other distinguished guests occupied the platform. An orchestra furnished spirited music for the occasion.

The fine hall was brilliantly lighted, the tables neatly and abundantly supplied, making a scene of indescribable beauty.

Thanks were offered by the Rev. J. S. MacIntosh, of Philadelphia, and after spending about an hour with the substantial part of the banquet, the intellectual feast began.

THE WELCOMING ADDRESS—BY HON. WILLIAM L. SCHAFER.

Mr. President and Gentlemen of the American Pomological Society:

The Pennsylvania Horticultural Society has had the honor of inviting you here this evening in order that its members and friends might have the opportunity, after the close of your laborious session, of enjoying a few hours of pleasant social intercourse, before your departure to your respective and far separated homes. There is but one unpleasant feature to mar this agreeable reunion,—the absence, on account of indisposition, of your distinguished President, the Hon. Marshall P. Wilder, and your very able First Vice President, Mr. Patrick Barry. We all hope and pray for their speedy recovery.

I now offer you, as the first sentiment, "The American Pomological Society."

First Vice President Berckmans then read the

RESPONSE OF PRESIDENT WILDER.

MR. PRESIDENT: Words cannot express the regret I experience in not being able to participate with you and my other friends of our nation in the privileges and pleasures with which you are crowning your courtesies to the American Pomological Society. I should have rejoiced exceedingly could I once more personally express to the members of the society over which you so gracefully preside the gratitude I feel for the aid which it has rendered in promoting the interests of our association. This is the fourth time that our society has been the recipient of your generous hospitalities, and for which we now and ever will express our most grateful acknowledgments. No place could be more appropriate for the assembling of our national society than this city, so renowned for its good deeds and good men; here where some of the first systematic efforts were made for the promotion of the agriculture and horticulture of our country; here where our tree of American liberty was planted, under whose wide spreading branches more than fifty millions of souls are now rejoicing in the blessings of peace and freedom. And let it ever be remembered that here were once the homes of Brinckle, Buist and James, who were among the founders of our society, and did so much to promote its progress and prosperity.

Mr. President, I rejoice most heartily in everything which has for its object the promotion of the science of the soil, especially in the growth and prosperity of our own association. When I reflect on its remarkable growth and influence, that at its establishment, there were only twelve states represented, and that it now embraces in its organization more than fifty states, territories and districts, all working harmoniously for the advancement of our cause, my heart rises in gratitude to the Giver of all Good that He has permitted me to see this day.

No nation has such grand facilities for fruit culture, and no people have made such rapid progress in that art. When I look forward to the possibilities and probabilities of our vast territory, capable of producing almost all of the fruits of the known world, and its rapid extension throughout our borders, my soul cries out, "Give me, O Lord! a few more years that I may witness more of the progress of pomology in America—more of the progress of liberty, prosperity, and greatness of the American republic."

President Wilder's appropriate and interesting address was well read, and was listened to with marked attention by every one present.

First Vice President Berckmans then announced the second regular sentiment, as follows:

"The Pennsylvania Horticultural Society."

Responded to by President Schaffer, who presented the statistics of the growth of Philadelphia and of the institutions of the Quaker City, all of which are given at length in the Pomological Report.

President Schaffer then announced the third regular sentiment, as follows:

"Pomology of the South."—Dr. Samuel Hape, Vice President of the Georgia Horticultural Society.

Dr. Hape made an eloquent and appropriate response, a copy of which has not been furnished the editor.

President Schaffer then announced the fourth sentiment:

"The Refining Influence of Pomology," and called on Dr. W. J. Beal, Secretary of the American Pomological Society, who spoke in the humorous line, [but was too modest to print his remarks or furnish them for publication—an example in a Secretary not to be commended.—G.]

President Schaffer then announced the fifth regular sentiment, as follows:

"The Growth of Horticulture in the great Mississippi Valley," calling on Hon. Parker Earle, President of the Mississippi Valley Horticultural Society.

Mr. Earle responded as follows:

Mr. President: The Mississippi Valley is truly a great one. It is not only the largest, but it is the richest valley in the world. It embraces twenty states—and they are all large ones—and several vigorous territories in training to become states. It extends from the Alleghenies to the Rockies, and from the great lakes to the Gulf of Mexico. I will not tell you anything about the wonderful richness of our soil, the weight of our farm crops, the size of our herds, the magnitude of our mines, of our seventy-five thousand miles of railway mostly built in a quarter of a century, for you all know that when any nation of the world gets hungry it sends to the Mississippi Valley and gets plenty of food, and when its clothes wear out we send the wool and the cotton to make more.

You have asked me to say something about the growth of horticulture in this great valley. But, sir, the subject is too large and the time is too short. I can truly say that some wonderful things

have been done both for and against horticultural progress during the quarter of a century in which I have been a witness and participator in this work. We have destroyed vast and valuable forests and seriously disturbed the balance in natural forces; and now we are beginning to plant new forests that this balance may be restored. We have planted great orchards of varieties from eastern fruit lists, and we have cut them down again because they had no value. But we have experimented as to kinds and methods; we have originated new varieties, and we have made great progress in this way. In fact, the pomological growth of the west has been very wonderful. Twenty-five years ago a dozen bushels of strawberries daily was a fair supply for the Chicago market. Now entire railway trains are required to supply the quantity necessary to furnish the dinner tables of that thrifty city. Fruit-growing and gardening has assumed great commercial importance with us. It is estimated that the amount of our orchard and garden produce entering into commercial channels aggregates fifty million dollars of value yearly.

And this great interest is destined to expand indefinitely. With the experience of years we are learning our limitations, and our confidence in what we can be able to do is better based than it was once. We have learned something of the difficulties to be overcome, and something of how to overcome them. When I began in the business, we did not take much account of difficulties. The fruit grower was always an enthusiast. He was a happy man; and his wife was happy, and his neighbors were happy. There were not any of them rich—in money—but they all had golden harvests just a year or two ahead, and they enjoyed the situation rather better than if they had the burdensome cash already in their pockets. We all felt as good in those days, as a man in Jersey now does who possesses a Kieffer pear tree; or as a man does anywhere who owns stock in the Niagara Grape! And that is just good enough. Nature's hand was generous, and overflowing, and perennial as—Mr. President, as Philadelphia hospitality, and that has never been known to fail!

But as I said we have a good deal of experience—the other fellows have got most of the money—and we recognize more clearly the rugged environments of our business, and we are better prepared to meet its difficulties, and to overcome them. And we still have courage to carry us forward—for hope springs eternal in the bosom of your true horticulturist—and imagination may not picture the grand results of our horticulture which the futur

holds. It will powerfully mould the civilization of a great people. And when the happy time shall come when every poor man's table shall be laden with fruits, and every cottage as well as every villa be adorned by some of the flowers and the arts of horticulture, all men will recognize with generous honors the large part which this great American Pomological Society, and its honored chief, now so unhappily absent from our meeting, have had in the accomplishment of so grand a result.

President Schaffer, after some appropriate words, then read the sixth sentiment of the evening:

"Fruits and flowers of the old world," and called on Rev. J. S. MacIntosh, of Philadelphia.

The address has not been reduced to writing. The speaker was truly eloquent in picturing some of the most beautiful scenes of England, Scotland, and the Continent of Europe. He closed by comparing the fruits of America with those of the old world. American fruits suffered no disgrace by his comparison.

President Schaffer again rose and read the seventh sentiment:

"The Pomology of the Northwest." He called on Oliver Gibbs, Jr., Secretary of the Minnesota Horticultural Society.

Mr. Gibbs spoke as follows:

Mr. President. If you mean by this toast to include the entire territory that I have in mind in attempting to respond to it—a territory too large and varied to define exactly here, but which comprises that portion of the new northwest, which is usually supposed to be mostly beyond, or on the verge of the fruit belt—in short that territory which has attracted hundred of thousands of emigrants in the last few years, as the country for cheap lands on which to make money by raising wheat or cattle, and to found new homes, I should not do my subject entire injustice, were I to dispose of it somewhat as the school boy did of his, when appointed to write a composition about snakes in Ireland and tigers in Africa, and who made his title answer mainly for the composition by writing, "there are no tigers in Africa and no snakes in Ireland;" for with the exception of some specially favored sections and some of the older settled portions, the pomology of this new northwest, is as yet, to say the best of it, largely experimental and not very *fruity*. We have in some parts of this territory, a peculiar and severe climate for trees and plants; intensely cold in the winter, and sometimes very hot and dry in the summer—where the temperature ranges at its lowest from 40 to 50° below zero, and at its highest from 80 to 100° in shade, and the average annual precipitation from about 10 to 40 inches, according to location.

It used to be said of the Maine Yankees, that if two of them were to be placed on a bare rock and obliged to go into business with no capital but the brains in their heads and the clothes on their backs, they would get rich off of each other by swapping jackets; and sir, if you were to put a Yankee upon an iceberg, or place a Quaker there, or a civilized foreigner from any country we know of, it is perfectly safe to say that he would find out how to raise fruit and grow trees and flowers there, or he would leave the place. There can be no permanency to the home of civilized man—in fact his abiding place is not a home, without these things, because there is no contentment there. The place where they cannot be grown, is a place where men are always on the watch to sell out, where everything is done for to-day, where the fathers, as they stay, descend in the scale of being, where the mothers are always weary, where the boys leave the farm, and where the girls ought to leave. Fully realizing the importance of this fact to the permanent development of the new northwest and the happiness of its people, the horticultural societies of the states, territories and provinces out there, have resolutely set themselves to work to overcome the difficulties in the way. To some extent they have succeeded, as an examination and a critical study of the fruits we exhibit here, in this off year of fruits, even with us, will show; and in the opinion of those best qualified to judge, we shall at no very distant day overcome them all, so far at least as to place a very large portion of the wheat growing lands of the northwest on an equality with any of the states in the Union, in the production of the apple, and in reference to forestry—for as pomologists and horticulturists we must never forget that—so far as to cover the prairies and plains in belts, with timber, without which a country as cold as that can never be said to be fairly inhabitable. Mr. President, these are sanguine words in regard to our fruit prospects in the new northwest, but I believe them to be true. You have seen our northwestern grown Duchess of Oldenberg on your tables here; our Wealthy apple, too, our beautiful hybrid crabs that taste like apples, and our lovely grapes. Can you excel them—any of them, in out door culture here in the east or down south for that matter?

And as we have delved in old records, and ransacked the world to find out where this blood in our few successful sorts of apples came from and why they do so well with us, where hundreds of eastern sorts have failed under similar trials, our minds have opened and taken in the fact, that it is not so much a question of climate and soil as one of adaptation. It now seems to us as we trace

the Duchess of Oldenberg to interior Russia, and have followed it up by recent explorations, that the principal reason why the east has so far beaten us in apple culture is that you have had this adaptation in your favor in planting the apple of the coast regions of Europe. We in our thirty years of general failure have been copying after you in the selection of races of the apple, without any adaptation at all except in the few sorts that you had, happily for us, from the Russian steppes. We now have facts on which to base a reasonable conjecture that what we call the severities of our climate offer no insuperable barrier to our pushing even the true winter apple well up towards the northern limit of the wheat plant. Prof. Budd and Charles Gibb, tell us that at Simbersk, the home of the Duchess, and at Kazan where the winters are as cold, snows inconstant, changes as sudden, and summers as hot and dry as the worst of ours, are to be found the largest commercial orchards on the globe—not alone of the apple, but of the pear, the cherry, and the plum, and that they found there last fall, the steamboats and barges of the Volga loaded to the water's edge with winter apples going south to market. To that country and to the production of new seedlings of our own we look for the extension of our pomology.

Mr. President, it has been a great pleasure to me, as the throngs of people have passed through your halls this week, and stopped to talk with me about the Minnesota fruit, to find so many people as there were who have friends in the new northwest, lately settled there, and to note the satisfaction it gave these visitors to find the evidence that their friends have not gone beyond the limit where it is possible for the settlers to raise their own fruit. I could see that many an anxious one's heart grew happier with the thought that besides getting some money out of wheat the settler out there might have a pleasant home. From the apple tree the imagination soon brings into view the shade tree, the evergreen, the rose bush, the lilac, the creeper over the porch, the bed of flowers upon the lawn. They all go together.

I have spoken of forests. The question of adaptation is of the first importance in this, but it is being studied out and worked out. Forests will yet cover the arid regions of the northwestern plains. Whether the rainfall will be increased thereby or not, evaporation will be retarded, which is practically all the same. Trees will cast their grateful shade, flowers will cluster round his door, and fruits,—home grown,—will cheer the table and the fireside of the pioneer even there.

One word more, Mr. President; and now I want the attention of the millionaires, as I see several of them present. As we have looked admiringly and may be with a little envy to-day upon the smiling face in marble of the sturdy old merchant in Girard College, have not some of you on this occasion, or have you not at some other time, had the thought come into your mind, "Oh, what could I do with my wealth to create such a memorial as this institution? What would do so much good, what would make me so honored and so loved as this? What other institution can I endow, that will give me a place among the few names that are not to fade out of the memory and records of man, and enable me, if perchance I shall be permitted, when the great change comes, whatever it is, to retain an interest in earthly scenes, to look over my work in this life and watch and enjoy its beneficent results hereafter?" It may seem to you that the places of great endowments are all filled, that nothing else can be devised beyond the commonplace; but, gentlemen, the philanthropist who comes forward to found and endow a school of Horticulture and Forestry in the Northwest will provide for the greatest need of the times and for all future time in that golden empire, and will place his figure in bold relief against the Western sky, to be gazed upon with veneration and affection, and grow brighter and grander in the view, and when in the far future mere military heroes shall be forgotten or looked upon as curiosities of a barbarous, or semi-barbarous past, every forest in the West, every improved fruit or flower, every improvement of the face of nature in city or country, from the advancement of the culture of plants, every happy home, will be associated with his name. The whole question, whether hundreds of square miles of the Northwest shall remain or relapse into a desert, or be made to blossom into a land of homes,—the question whether other hundreds of square miles shall wait, for generations, to grow comfortable, or, by the short cuts of knowledge, prove horticulture and forestry a relief to those who are there now or are soon to follow,—can be solved by such an institution, liberally endowed, as no other means can do it. And when horticulture and forestry shall become established over the West by such an institution, nothing else can so train young men and young women in these learned professions, to continue the work to the end of time. Our State colleges of Agriculture are doing all they can for these sciences, but their means are too limited, and their liberty is too circumscribed by lack of patience and appreciation of the average politician who goes to the Legislature. I am sorry to say they are not all the

pets of the legislature as it is said is the one in Michigan. We want a school that can work with scope and means and freedom on long headed and level headed plans for the public good, and yet be out of reach of popular clamor. We want a school established with a central head and with experimental stations in the several natural divisions of soil and climate; a school that will know no State lines, and nothing that is not, or not likely to be practical. Where is the happy millionaire or syndicate of millionaires who will give it to us?

Mr. President, I shall carry home with me a pleasant remembrance of the hospitality of the Pennsylvania Horticultural Society and the citizens of Philadelphia. Nothing has been omitted to make the visit of the members of the American Pomological Society agreeable to themselves, or useful to the communities they represent.

President Schaffer then announced the eighth and last sentiment of the evening.

"Pomology of Canada." Prof. William Saunders, President of the Fruit Growers' Society of Ontario, London, Canada. I call upon Mr. Saunders for a response.

This was given in very fitting words by one who has long been active in advancing the interests of Canadian Entomology and Horticulture. The editor has not been able to secure a copy of the address.

Some appropriate remarks were made by First Vice President Berckmans, and the company dispersed, subject to the call of the executive committee to hold its next meeting in 1885, in the state of Michigan.

Thus closed a very large and successful meeting of the American Pomological Society.

REPORT OF THE GENERAL FRUIT COMMITTEE.

To the President and Members of the American Pomological Society:

GENTLEMEN:—The undersigned, on behalf of the General Fruit Committee, respectfully reports that he has been diligent in his efforts to secure reports from all the states, territories, and districts embraced within the scope of the Society. A circular was issued in May, 1882, and sent to the chairmen of the several state committees; a copy of the circular is appended, and is as follows:

AMERICAN POMOLOGICAL SOCIETY.

(ORGANIZED 1848.)

To.....

Chairman Fruit Committee, for State of.....

DEAR SIR:—At the last session of the American Pomological Society held in the city of Boston, September 14th, 15th, and 16th, 1881, you were appointed chairman of the fruit committee of your state. The duties of this committee are defined in the society's by-laws, as follows:

"State Fruit Committees, consisting of five members each, for every state, territory, and province represented, and a general chairman over all, shall be appointed biennially. It shall be the duty of the several state fruit committees to forward to the general chairman, one month before every biennial meeting, State Pomological Reports, to be condensed by him for publication."

It is customary for the chairman of the state fruit committee to select his associates, and you are respectfully requested to organize your committee at the earliest moment practicable, if not already done, by selecting the most competent and trustworthy persons in different sections of your state to aid you in collecting the information desired by the society, and transmit the same to me as early as the first of September next.

The nature of the information desired may be briefly stated as follows :

1st.—Species of Fruit. What species of fruit, as apple, pear, peach, plum, cherry, &c., &c., are grown successfully in your state?

2d.—Varieties of Fruits. What varieties of these fruits have been found, by experience, best adapted to the soil and climate of your state and its various parts? The degrees of merit should be stated according to the scale adopted in the society's catalogue, viz: those worthy of cultivation designated by one *; those of great superiority and value by two **; those of more recent introduction and giving promise of excellence †. In this connection you will please examine the lists of varieties, if any, recommended in the societies catalogue, for your state, and suggest such changes or additions as may, in your judgment, be necessary.

3d.—New Native Varieties. If there are any new varieties of recent origin in your state, giving promise of excellence, you will please make special note of them.

4th—Synonyms. Give as much information as may be in your power in regard to the different names by which the same fruit is known in your state.

5th—Obstacles to Successful Fruit Culture. What are the chief obstacles to successful fruit culture in your state, as regards soil, climate, insects, diseases, etc., and what remedies have been most effectually employed?

6th—Culture and Pruning. What treatment of the soil of fruit tree plantations, and what system of pruning, have yielded, in general, the best results?

7th—Storing and Keeping Winter Fruits. What methods are most successfully practiced?

8th—Packages. What sort of package has been found most advantageous, especially for shipment to distant markets, and especially for Europe?

9th—Statistics. If convenient, statistics showing the extent and progress of fruit culture in your state.

If, for any reason, it may not be in your power to report upon all the points enumerated above, be kind enough to do what you can, giving precedence to 2d and 3d, relating to "Varieties of Fruits."

In cases where state committees have made full reports at recent sessions, they will not be expected to go over the same ground again, but will simply report such changes in regard to the value of varieties, as later experience may justify; and such new facts in regard to the general subject of fruits and their culture, keeping, marketing, etc., as may have come to light since the last report.

The 9th point, "Statistics," showing the extent and progress of fruit culture in your state, will always be interesting and instructive. The extent of recent planting, the largest orchards, the varieties most extensively planted, average prices of the various fruits, estimated value of total fruit production in the state, etc., etc.

This circular is sent out at this early period for the purpose of giving committees ample time to organize and have the benefit of two full seasons' experience before making up their report. The next meeting is to be held in Philadelphia, in the month of September, 1883.

And now I ask of the state committees to continue their kind co-operation. Through their reports the society must accomplish its most important work.

The thirty or more reports in the Volume of Transactions, just published, contain a vast fund of information in regard to the fruit culture of our country that could not be obtained from any other source.

If you have not received a copy of the last Volume of Transactions, you can procure it by addressing Prof. W. J. Beal, Secretary, Lansing, Mich.

Respectfully,

P. BARRY,

Chairman General Fruit Committee, Rochester, N. Y.
April, 1882.

REPORT FROM MINNESOTA.

LAKE CITY, MINN., Oct. 30th, 1883.

Prof. W. J. Beal, Secretary American Pomological Society, Lansing, Michigan.

MY DEAR SIR :—I would recommend to the committee on the revision of the catalogue that they erase from the Minnesota column the stars now printed against Ben Davis, English Russet, Haas, Golden Russet, Late Strawberry, Maiden's Blush, Rambo, Red Astrachan, St. Lawrence, Sops of Wine, and Talman Sweet. They are all growing here, but have not been classed by us as worthy of general cultivation since the hard winter of 1873.

2d. Add a star for Alexander and Wolf River.

3d. Transfer Edgar Co. Red Streak to the W.'s, and call it Walbridge, as it is more generally known as Walbridge. Give Edgar Co. Red Streak as its synonym, and change its color to r. s., for red striped.

4th. Mark Wealthy, Alexander, and Wolf River as red apples, and Utter as red striped. An apple should be given the color it shows at maturity, under its best conditions.

5th. Give Yellow Transparent a star.

In the Crab list, double star the Whitney and add the following with double stars ; Early Strawberry, Beecher Sweet, Orange, Conical, Orion, and Minnesota.

In Gooseberries star the Houghton.

In Blackberries star the Snyder and Stone's Hardy.

In Grapes star the Worden and add Janesville with a star.

In Plums add Forest Garden, DeSoto, and Weaver, and give them double stars, and describe them as follows:

Forest Garden,—m., r., r., v. g., F. M., E., Am.

De Soto,—m., r. o., y. r., v. g., F. M., M., Am.

Weaver (free stone),—m., flat r., v. g., F. M., M., Am.

In Raspberries star the Philadelphia and change Seneca from dagger to star; also star the Gregg.

In Strawberries erase star from Agriculturist and add it for Capt. Jack and Glendale. Add Downer's Prolific and give it a star, and double star the Wilson.

We have many promising sorts of apples, grapes, strawberries, and raspberries recently introduced, or just coming into bearing; but as I am unable to give their descriptions fully, I will leave them out. Next year we will try to take notes of all our successful fruits, at maturity, with a view of having a complete Minnesota list for the Michigan meeting in 1885.

Describe the new Crabs recommended as follows:

Early Strawberry,—m., r., r.s., g., F., S., Minn.

Beecher Sweet,—m., r., r., v. g., F. M., E. A. Minn.

Orange,—m., r., o., g., F. M., L. A., Minn.

Conical,—m., c., r., v. g., F. M., E. A., Minn.

Orion,—l., o., r. s., g., F. M., L. A., Minn.

Minnesota,—v. l., o., y. r., v. g., F. M., L. A., Indiana.

Please refer this to the committee.

Yours truly,

OLIVER GIBBS, JR.,

Sec'y State Horticultural Society.

WHO READS AND WHO CARES?

A TRIBUTE TO COLONEL D. A. ROBERTSON.

[The following paper and the proceedings that ensued after its reading were omitted from the regular report in order to afford Colonel Robertson an opportunity to furnish notes of his remarks, which are now printed in full.—SECRETARY.]

Horticultural writers and speakers are a class who do a great deal of public work for little pay. They are generally satisfied if they have reason to believe that their labors are appreciated by a few and likely to be of benefit to the many; but there are times

when their courage flags and their spirits fall for want of even this encouragement; and it is to help some of them over their fits of despondency that I seize upon a text and an opportunity going to show how, after many days, the bread may return upon the waters to sustain and cheer one who has sent it forth.

"What use in writing? Who reads and who cares?" This is the text. I take it from a postscript of a letter from F. K. Phenix, in reply to one urging him to continue his writings on the production of new and improved varieties of the apple by careful attention to seedlings.

"Who reads and who cares?" Let us see. Twenty or more years ago, when northwestern farmers were getting their first discouragements in orcharding, from winter killing and summer blight, Col. D. A. Robertson, of St. Paul, published articles at various times in the Minnesota papers, in which the theory was advanced and argued out that for immediate success in the culture of tree fruits it was necessary to get varieties already adapted by long processes, in older countries, to a climate similar to our own; and in 1867 he read an elaborate essay on the subject before the Minnesota Fruit Growers' Association, of which he was president, in which he showed by facts ascertained in the course of his various studies that in the interior of Russia was to be found the counterpart of our Minnesota, Dakota and Manitoba climate, in aridity of air, hot summers, cold winters and inconstant snows, and at the same time immense orchards of excellent apples, pears, cherries and plums, at points varying from the latitude of St. Paul to 500 and more miles nearer the North Pole.

This essay, which was entitled "Climatology in its Relation to Fruit Growing," was printed in the St. Paul Pioneer, and portions of it in other papers at the time; and in 1873, when the proceedings of the Fruit Growers' Association were gathered up and incorporated into the first report of the Minnesota State Horticultural Society, it was given a place in that record. It contained about all the wisdom there was then or is now extant in this country on the subject of climatic adaptations in the selection or improvement of races of fruits for the Northwest. It was an accurate and a philosophical dissertation, the result of close observation and deep study; and the ideas therein presented, the facts brought out, and the suggestions made, were the foundation upon which all the American work has been done in bringing out the Russian fruits which are now attracting such widespread attention. I quote two paragraphs to show the scope of the essay:

"We must, I think, for entire success in our day and generation, procure by some means for naturalization in Minnesota, varieties which thrive in the cold countries referred to, and especially in the *continental or interior* parts of Russia and northern China, where the climate is like ours, not only intensely cold in winter, but also dry as compared with maritime or lake coasts, and hot in summer, and the growing seasons of which are short like ours."

And again:

"Is there not to be found somewhere in the north, at least one lover of horticulture who has the necessary knowledge and the will to go and collect from the countries referred to, varieties of fruit trees for adoption here, and who has, also, what is essential, money enough to pay his way? Such a man, who will thus devote himself to the public good, will confer an incalculable benefit on our state, and entitle himself to the rank of a public benefactor."

Remember that articles of this import were published by Col. Robertson prior to any known effort at importations of fruit cions from Russia (except those of Thomas Andrew Knight, in England, in the last century, from which came our Duchess), and now let us see how they and the essay of 1867 have borne fruit.

In 1866 A. G. Tuttle, of Baraboo, Wisconsin, commenced the experiment by cions from St. Petersburg, obtained through Hon. Cassius M. Clay, then United States Minister to the Russian Government. He followed it up by getting other cions from Moscow; and within a year from the final publication of the elaborate essay in 1867, a scheme was hatched in the fertile brain of Wm. Saunders, Superintendent of the Agricultural Department grounds at Washington, to import the Russian apple stocks by wholesale and make the experiment general throughout the north.

There being no commercial sources then known to which he could apply, Mr. Saunders commenced gathering up and forwarding American trees and plants to the Russian Botanical gardens at St. Petersburg, and after continuing this work for two years, he applied to Dr. Regel, the government director there, for cions of Russian fruits. The result was the importation of the well known apple cions of 1870, which were planted and grown in the Washington grounds till the winter of 1875 and 1876, and then sent out under the names and numbers to all parts of the United States and Canada where they were wanted for trial, and whose fruits have been coming into notice within the last two or three years.

Twelve years later, in 1882, Charles Gibb, of Abbotsford, Canada, and Prof. J. L. Budd, of Ames, Iowa, were wandering in the regions of the Volga, searching out the orchards of Simbirsk,

Kazan, Kursk and Saratov, as described by Colonel Robertson from those old records in 1867, and the cherry orchards of Vladimir.

Mr. Tuttle, who appears to have been the pioneer importer, told me on the cars returning from Green Bay, a few days ago, that his attention was first drawn to the subject by the writings of Colonel Robertson. Mr. Saunders does not remember, as he informs me by letter, where he got his ideas that led to the government importation, except he had heard and read that Russian sorts like the Duchess and Tetofski were the only ones showing adaptation to the extreme north, and the pressure was upon his mind that the northern fruit list might be extended by a further trial of Russian trees; but nowhere else in the horticultural literature of that time have I been able to find any writings of this elaborate character on the subject, or any such facts as are presented in this essay, and the indications are too strong to be overlooked—perhaps some of our Minnesota Senators or Representatives may know—that Col. Robertson's facts, ideas and appeals were disseminated among the agents of the Government at Washington, through the press or by personal interviews, and had the influence that resulted in the very efforts he had so forcibly suggested years before. But however this may be, Charles Gibb informed me last fall that wherever he and Prof. Budd traveled in their searches for orchards east of Moscow, they used this essay as their guide-book; and Prof. Budd, in a recent letter, writes about it as follows:

"It served as an incentive to open up correspondence with Russian fruit growers, and specially directed our steps to Simbirsk; and when Gibb and myself stood on the high bluffs west of the Volga, overlooking thousands of acres of ground covered with apple and pear trees, we remarked that the reality far exceeded the idea expressed by Col. Robertson in the Minnesota Horticultural Report. We also made a similar remark when passing through the great cherry growing sections of Vladimir. Beyond all doubt Col. Robertson deserves the thanks of the people of the Northwest."

"Somebody must go to Russia," was the idea of Col. Robertson. Mr. Tuttle, in 1866, and Mr. Saunders, in 1870, sent there for cions and made a beginning. "Somebody had to go to Russia," said Charles Gibb in his report in 1882, "and Prof. Budd and I went." Until a month ago Col. Robertson remained in entire ignorance during all these years, that his studies and writings on this subject, in 1867, and before, had borne any fruit whatever. His bread had been cast upon the waters. That was all he knew.

The importance of the effort made by Mr. Tuttle and Mr. Saunders, and the value of the personal searches of Charles Gibb and Prof.

Budd, the importations they have made and that are to follow, the trials and the siftings of sorts that are to be made, and whether as the results therefrom, our dry interior prairies are to be eventually covered with orchards of the apple, the pear, the cherry and the plum, as similar regions hundreds of miles to the north of us in the interior of Russia are now covered, is not the object of this paper to discuss. All I have aimed at is to answer the question of Mr. Phenix, "*Who reads and who cares*" when new or valuable facts and thoughts are sent out through the press? The lesson and the encouragement is to us horticultural cranks to go on in our chosen work. For if I have proved anything, it is that in seventeen to twenty years by the almanac and the watch, we may wake up some morning and find ourselves famous and honored for the good we have done; and this is better than to be killed in foreign wars and have our names spelled wrong in the dispatches. For anything written or said that helps anybody out of their difficulties, *somebody reads and somebody cares*.

OLIVER GIBBS, JR.,
Secretary.

Lake City, January 5th, 1884.

Upon the conclusion of the reading of the above paper, Col. John H. Stevens rose and said:

Mr. President: The facts stated by the secretary are well known to all the older members of this society. Col. Robertson has done more for the advancement of general horticulture than any other citizen of the state. He long ago mastered the underlying principles, and had the happy faculty of instructing the people in their work in trying to grow trees in this climate, and gave much of his time and his best thoughts in his writings for the press and in public addresses on the subject. I am happy to see that he is once more present with us to-day, in person as well as in feeling; and as a proper recognition of his services in the past, I move that he be declared an honorary life member of the Minnesota State Horticultural Society.

The motion of Col. Stevens was unanimously adopted.

Col. Robertson then said: Mr. President and members of this Society; the honor you have conferred upon me is very gratifying. For a number of years past other objects than horticulture have claimed my more particular attention; but I have been well aware, at all times, of the importance of your work, and have regarded with pride the increasing strength and influence of your society. Younger heads and younger hands than mine must in the future

carry on your work; but so long as I may be able to do so, I will be most happy to aid you in any way in my power, and will, as heretofore, always continue to take a lively interest in your proceedings. May success ever crown all your efforts for the public good.

And now, Mr. President, and members of this society, I would like, were it not taking up too much of your valuable time, to say something more on one or two topics.

[Several members: Go on Colonel; go on.]

I would like to express with more becoming propriety, my feelings of heartfelt pleasure and gratitude, evoked by the surprise, the honor and the distinction you have so generously associated with my name, and by making its mention, an inexpungable page in the horticultural history of Minnesota; and also for mentioning it in the history of this society as worthy to be associated with yours, gentlemen, who are the practical horticulturists of this state, and you, whose labor, above that of all others, has won for this society, from the recent Congress of the most eminent horticulturists in this country, representing the horticultural societies of the United States, of the east, the west, the north and the south—has won for it, I repeat, the highest recognition possible to be expressed by any decisive authority, which recognition has won for this society and state, the highest prize for excellence in apple and grape culture, which was attested by the unanimous award of the Wilder Memorial Medallion, which places this state in the front rank of American Pomology, not only for what has been already accomplished, but for the assured promise of progressive improvements in all branches of plant culture; for, it is successful apple growing that assures in any climate successful horticulture, in general.

The competitive exhibition of the apples of this state, of both seedling and grafted trees, which was made before the late Pomological Congress, side by side with collections of apples from the other states, the old and the new states, became, when submitted to the ordinary tests of excellence, a most surprising demonstration, ocular and gustatory, and it was this that won for our society and for Minnesota the highest award for success in apples, and grape culture also. Although this distinguished award has been scarcely heard of by our people, because not more fully noticed in newspapers, the time must soon come, when it will be better known, and its importance more deservedly appreciated, and then the success already accomplished, as attested by the Wilder award, will be considered as worth to this state not only hundreds of thousands, but millions of dollars; and then, too, this estimate

will not be considered as a wild exaggeration of our horticultural enthusiasts. The recent Pomological Congress, in which your secretary was the only representative of this society and state, will be the date of a memorable epoch in the history of Minnesota Horticulture. Your secretary has made his comprehensive report, so I need not further dwell upon this most interesting and suggestive topic. I cannot, however, close it, without adding that this society, and the people of this state owe to him their hearty acknowledgments for the completeness of his preparatory labors, and for the fidelity and ability with which he performed his representative trust, which was essential to the achievement of this, our grand pomological triumph.

I again thank you for the honors you have conferred upon me, and for the opportunity to make these remarks.

IMMEDIATE INFLUENCE OF POLLEN.

At the recent meeting of the American Pomological Society there was an interesting discussion upon facts presented by J. H. Hale, J. B. Rogers, J. T. Lovett, and others, indicating that in planting staminate strawberries to fertilize the pistillate varieties, the latter are not only made fruitful, as all well posted strawberry growers know, but the color, texture, size, and perhaps even the flavor will sometimes vary according to the character of the staminate variety used in the process. Many facts were given to support this theory, which if true, gives us more power in the improvement of our small fruits than has heretofore been thought possible. Upon this basis we may possibly correct faults even in the staminates themselves. The Sharpless, for instance, by having some neighbor more prepotent than itself in the influence of its pollen, may be given an outside finish that will resist the rot in hot and rainy weather, that so often spoils the largest specimens of the berries before the pickers can "get there." On my own grounds in a small experimental bed last summer, I found a row of Crescents having throughout the season the color and firmness of the Wilson. I was puzzled with it then, but now, under the new theory, can account for it by referring the change to the benefit from the row of Wilsons that grew next to it; and my Glendales growing alongside of Wilsons were very bright in color, although said by others to be often of a dull, dirty hue. And why may not some of the

many variations of apples upon the same tree or neighboring trees of same sorts be due to this immediate influence of prepotent pollen, either at the time or through reversion or heredity? It is usually supposed that the change in the character of the fruit from the effect of foreign pollen becomes apparent only in the next generation through the seeds, yet any one who will read Darwin's "Variation of Plants and Animals under Domestication" will see that cases of the contrary, namely, immediate effect upon the receptacle of the seeds or what we call the pulp or fruit, are not very rare. The most notable case given in this work is that of the St. Vallery apple, whose stamens being abortive, the children in the neighborhood apply to them pollen from other varieties of apples, and attaching each their own name to the spur or blossom fertilized by this pollen, claim and receive from the tree in the fall, each one a different fruit from the branch they had fertilized and labeled. The study of blossoms and seeds lies at the base of all systematic improvements in fruits as well as flowers.

Below will be found the remarks of Messrs. Rogers and Lovett, above referred to, and an interesting letter from Mr. Hale on this subject.

G.

J. B. Rodgers, of New Jersey. This year the Manchester has surprised the growers on account of the large size it has attained, when planted near certain varieties as a fertilizer for it. When first grown on Mr. Battey's place, where the flowers were fertilized with the Wilson, it resembled the Wilson, and in many cases only a close inspection could determine the distinction between the two. Last year many experts were fearful that there were two or more berries put out under this name, as the color of the fruit was so variable. This year, however, has demonstrated that size, shape, color, and firmness is greatly altered by the varieties near which it may be planted. When the Wilson is used, the Manchester is small, hard, not very productive,—poor in all respects except color. Sharpless gives largest berries, although apt to produce sports in shape of the Manchester, also renders in most instances a more firm carrying berry. Bidwell gives good results, in shape uniform, deeper color, variable as to firmness. Cumberland Triumph gives a berry much like itself in all respects. Miner's Prolific, as to results much the same as the Wilson.

Early in the summer of 1882, Mr. Hovey having advanced the claim that the Manchester and Hovey seedlings were identical, a very close scrutiny was had into the merits and characteristics of

the Manchester. Berries were found of several shades of color and sizes. Mr. Hovey, after a while abandoned the assertion that the two varieties were identical, but not before the fact that fertilization with different varieties seemed to produce variable results as to color, had been noted. The Manchester, as exhibited at the New York Horticultural Society exhibition this summer, raised by the side of different varieties, clearly proved this assertion, and this on the grounds of several persons, some of whose places were 100 miles apart. Manchester by the side of Cumberland Triumph, gave the same results this season in three cases, one in New Jersey and two in Connecticut, and each widely separated.

In a conversation with Mr. Durand on the fertilization of varieties one with the other, and the effect that it had in the form, shape, color, and flavor of the berry the first year, he said that there was no doubt that certain varieties made much better berries in all respects if planted near one another. This was in respect to the difference observable in the Jersey Queen when planted in close proximity to some varieties. Last year the most magnificent crop ever seen was on a bed near the Bidwell. The two or three rows next the Bidwell were immense in size, good color, perfect berries, while in the same bed a few rows near the Sharpless, were much inferior and smaller in size. This effect does not seem to be confined to pistillate varieties only; even hermaphrodites partake of the size, shape, color, and flavor one of the other. The present season in my experimental beds, Sharpless and Primo, set side by side, in the same row, blossomed about the same time. The Primo partook of the shape of the Sharpless, which were sports, in size two or three fold larger than Primo by themselves; color lighter, and softer than on the other row. The rows from which the plants both of the Sharpless and Primo were taken to set in the row, were turned about but not within the same soil or eight feet from one another, produced as to Sharpless the same general characteristics of berry as the other. The Primo, however, had only the average berries as to size, shape, and color, whereas the Primo fertilized with Sharpless were the largest specimens ever seen. A prominent nurseryman wishing to have a sample of the Primo engraved for his catalogue, declined the offer of taking such from a quart picked from the plants near the Sharpless, giving as the reason the public would be deceived from the size. In this case the productiveness of the berry was very much increased. From observation and experience I believe that many of the contradictory reports had from the new fruits in experimental beds

arises from the uncongenial neighbors planted near. In many instances may not the result of a whole year's labor be lost from the same courses.

I would not have it inferred that I wish to give any undue preference to the Manchester by these remarks, only that like the Concord among the grapes, from certain causes taking a high place and giving a stimulus to grape culture. So the Manchester possessing, as it would, such a marked preference to certain varieties, as a fertilizer, has, as it were, opened a new field for experiment. When experiments are made over a more extended field, results may vary. Only such a short time has elapsed since the first observations were made, that nothing conclusive can be determined, only extended and thorough experiments can fully demonstrate the value of this subject.

This subject of the effect of the male plant upon the fruit has been under observation by the members of the New Jersey State Horticultural Society since 1881. At the annual meeting held in February of that year, Mr. C. W. Harrison asked if pistillate varieties were less firm than perfect flowering varieties? He had found that Gypsey, fertilized by Black Giant, partook of the nature of the latter. Champion fertilized with Great American resembled it. Their resemblance was very apparent in color and firmness of flesh. Pale berries fertilized with dark ones he was sure would be improved in color.

J. T. Lovett cited a garden in which some years ago were Wilsons and French Seedling strawberries, and no difference could be detected in the looks of the fruit. The flavor of the Wilson was also improved. The next year, 1882, it was noticed that Glendale and Sharpless planted side by side produced berries on each row possessing characteristics of the other, and where they had run close together it was still more marked. In picking two or three quarts of the Glendale, a large proportion would show characteristics of the Sharpless.

The subject of the effect of the pollen upon pistillate varieties of Strawberries came up before our State Horticultural Society some years ago, when it produced much discussion. It elicited the expression of several growers of wide experience. Without an exception they testified that pollen from perfect flowered varieties not only exerted an influence, but a most decided one, upon the fruits of pistillate sorts. I have previously noted the phenomenon, and set about the following spring a series of experiments to ascertain to what extent the influence of a pollen-bearing variety was trans-

mitted to pistillate ones through the fructification of the flower. I was surprised to learn that it was so great as to render it of a widely different character, almost unrecognizable, transmitting not only the color of the pollen-bearing variety, but the size, form, and texture of fruit as well.

Mr. J. T. Lovett further said: I have experimented with melons also, and have found that the male element affected the melon as well as the seeds. I am aware of the fact that the subject before the house is one bearing upon vegetable physiology, but if the pollen fertilizing the flower of a pistillate variety exerts no influence upon the pulp of the Strawberry, why plant pollen-bearing varieties near pistillate ones? or, in other words, why fertilize the blossoms of pistillate varieties at all? For analogy's sake I extended my experiments to melons, and found the influence of the pollen fertilizing the blossoms equally potent in its influence upon the flesh of the fruit. Seeds of musk melons were placed by the side of cucumbers, and also in an isolated location. Those near the cucumbers partook of their character to an extent that rendered them unpalatable, while those grown where the blossoms were self-fertilized were excellent. I took the precaution to have all the seed used in the experiment taken from the same melon.

W. C. Strong, of Massachusetts. I had Manchester between Sharpless and Charles Downing, and it did well. Mr. Capen, of Boston, has had wonderful results with the Manchester fertilized with Charles Downing.

P. J. Berckmans, of Georgia. I think this influence of pollen might largely account for the variety of success with certain berries, even more than a variety of soil.

H. M. Engle, of Pennsylvania. The remarks of Mr. Rogers open up a great question. I should like more experience on this point because we have so many pistillate varieties.

E. Williams, of New Jersey. I never had anything produce better on my grounds than Manchester fertilized with Sharpless and Charles Downing. I have seen a bed fertilized by Wilson that failed.

Secretary Beal, of Michigan. This is an exceedingly interesting topic. If the results are as claimed by the former speakers, they are indeed wonderful. The edible portion of the strawberry is not a true fruit in the botanical sense, but a large *torus* or *receptacle*, which is the tip end of the flower stem very much enlarged. This is a promising field for many well tried and often repeated experiments.

LETTER FROM J. H. HALE.

ELM FRUIT-FARM AND NURSERY, }
 SOUTH GLASTONBURY, CONN., March 6th, 1884. }

Oliver Gibbs, Jr.,

DEAR SIR:—Your favor of the 1st just at hand, and I am glad to be able to comply with your request and give you what few facts I have in regard to the cross fertilization of strawberries, specially as regards the immediate effects on the fruit of the pistillate varieties.

In reply to the question, what perfect flowering varieties shall we plant to fertilize the Crescent, Champion, Manchester or other pistillate sorts. The general answer would be, plant *any* that blossom at the same time as the pistillate to which you wish to supply the pollen.

However, from a somewhat careful study of this question for some years past, I have become convinced that the *size, color, form, texture and flavor* of the pistillate to some extent depends upon what variety furnishes the pollen to fertilize its blossoms, and will give you what few facts I have that bear on this question. Crescents fertilized by Wilson's Albany gave medium to small sized fruit, bright in color, poor in flavor, and moderately firm; while Crescents with Downing to fertilize it gave larger fruit, not as perfect in form, much softer, dull in color and of very good flavor. With Sharpless the Crescent was of increased size but not as firm as when grown with the Wilson. Fertilized by the Bidwell the Crescent had a number of the berries that were of the peculiar form of the Bidwell. And the only coxcomb Crescents I have ever seen were those fertilized by President Lincoln, a variety that has a majority of misshapen berries.

The Manchester, fertilized by Wilson, Finch, Mount Vernon, Cumberland Triumph or Miner, and every berry was as perfect in form as though run in a mould; while Manchester with Sharpless gave a number of berries *similar in form to the Sharpless*. Fertilized by Cumberland, Manchester was pale in color, quite soft, but of fine flavor; while fertilized by Wilson they were *firm*, of rich bright color, but quite acid and of inferior flavor. Manchester, fertilized by Black Defiance, was even darker in color than when with Wilson, and of superior flavor, almost equal to Black Defiance, itself; and the difference in color between these and the Manchester fertilized by Cumberland was so marked that it was

hard to believe that they really were Manchester, grown on soil of like character, planted at the same time, manured in the same way, only forty rods apart, but fertilized by different perfect flowering sorts. Champion is not as dark in color or as acid, when fertilized with Cumberland Triumph, as it is with Wilson.

These and other marked changes that I have noticed have convinced me if that I have a pistillate strawberry, that under ordinary conditions is lacking only in flavor, I can improve this to some extent by planting with it, some perfect flowering variety of high flavor, and so on through the whole list—size, color and texture—each of these can be improved by the proper selection of perfect flowering varieties having the qualities that are deficient in the pistillate when grown without care or thought in the matter.

Even the perfect flowering varieties themselves are more or less affected by other perfect flowering ones, if grown with or near them. Thus Wilson and Sharpless grown together the past season gave larger, more irregular and better-flavored Wilsons than when grown alone, while the Sharpless were darker in color, firmer, and more acid than when grown alone; and from my present lights on the subject, if I were growing the Wilson strawberry for profit, every third row would be planted with Sharpless or some other perfect flowering, large berry, to increase its size; while to improve its flavor, I would plant President Wilder, Downing, or other fine flavored varieties. I shall experiment further, in this direction and trust that you and others will do the same.

Very truly yours,

J. H. HALE.

THE LAW IN CROSS-BREEDING.

In reference to fruit trees and plants, as was stated in the debates at the annual meeting, all the facts I can find, new or old, by reading, by observation, and by inquiry, point one way in this: That the mother tree or plant is most likely to impart the constitution, habits of growth, and external finish to the new seedling, and the male plant the quality and the season of the fruit. Mr. Pepper has always, I think, found it so in his experiments; and Dr. E. Lewis Sturtevant, at the New York Experiment Station, at Geneva, who is very cautious in statement, told me last fall that so far the facts developed in his work indicate the same, although he

did not claim to have found enough to prove it to be a law. In illustration he showed me a lot of seedlings from the Turkish Cap tomato, a rot proof variety. The tomatoes on all of these seedlings were like those of the mother plant in respect to being free from rot, although their size, shape, and quality was as various as might be expected from unisolated pollen, mixed as it would be liable to be by the winds and insects. It may be reasonably expected that in this case, when both pistils and pollen shall be perfectly isolated, and the pollen being taken from a choice, hardy variety, among some of the seedlings will be found a good tomato on a stock that will make it rot-proof, and whose character may be fixed as a distinct variety.

Gardeners as well as fruit growers and farmers have much to hope for in the work of the agricultural experiment stations in the discovery of facts bearing upon this law.

In our efforts to originate hardier, better, and longer keeping fruits by seedling production, we shall save much time and labor, (heretofore wasted in hap-hazard work, where not one seedling tree in ten thousand is ever an improvement) if we find out and apply the laws of variation whereby improved conditions around the parent plants, impart a tendency to improvement in their progeny, and the law of cross-breeding whereby these tendencies are developed, united and fixed. We shall find analagous facts for guides in these things in close observation of all plant and animal life. Races improve in reproduction solely through improved conditions in the parent life, and through proper unions of strength and quality. We cannot attend too carefully to these conditions in the culture of all living things over which we have control; for there is abundant evidence of the certainty that every mood of the parent life is liable to transmission to succeeding generations for better or for worse.

Mr. Saunders, at Washington, told me of two interesting experiments that he had made some years ago. Wishing to fix the strong upright stem and other vigor of the Fillmore strawberry upon some new plant having a better berry, he fertitized the Fillmore pistils with pollen from one of the black varieties; he had forgotten the name of it, but probably it was the Black Defiance. Among the new seedlings was a plant having the very character he sought to produce; a plant of good foliage, the stem stout, holding its fruit clear from the ground, and the berry of excellent quality. The name given to the new plant was Patuxet. It was lost in the mud of the overflow of the Potomac into the Agricul-

tural Department grounds, caused by filling up the old Washington and Georgetown canal, but Mr. Saunders thought some of the plants from its runners sent to A. M. Purdy, of Palmyra, New York, may have been preserved.

The other experiment was with raspberries. Doolittle black cap blossoms were fertilized with pollen from the Philadelphia red, and among the seedlings was this remarkable variation: a raspberry bush of the black cap form, bearing red berries like those of the male parent. This was also buried in the mud.

The practical lesson from all of the facts should be often stated and reiterated: Choose for seed bearing the hardiest and thriftiest forms of best habits of growth, and when possible fertilize by hand with carefully isolated pollen from the sorts whose quality and season of ripening suit us best; never forgetting, however, that there must be as careful isolation of the pollen as of the pistils, and not expecting too certain results in every case; for with the utmost accuracy and care in our work, nature will have her own way sometimes and get the better of our inclosures, and astonish us with new puzzles in reproduction; and more than this, perhaps, is the fact that we have always to deal with the forces of heredity and reversion as to previous mixtures of which we may know nothing whatever.

G.

INSECTICIDES AND OTHER DESTROYERS OF INSECTS.

In a conversation at Philadelphia, with Elisha Moody, of Lockport, New York, he informed me that his firm E. Moody & Sons, nurserymen and fruit growers, had for two years past sprayed their fruit trees with London Purple, and they have no more trouble with insects. They use one pound of the purple to 200 gallons of water, and put it on with a hand pump worked from a barrel of the mixture in a wagon, driven about among the trees. As yet they have no better way of keeping it stirred up than to have a man stand by the barrel and stir it with a stick, but are experimenting with a mechanical contrivance for the purpose attached to the wagon wheel. They have 20,000 pear trees in one orchard. Their object in using the poison was to destroy the codling moth, spraying the trees when the apples or pears are about the size of bullets, when the calyx is upright and holds the poison long enough to destroy the

larvæ before it penetrates the fruit, and while perfectly successful in this they found the curculio also had disappeared from their plum trees. "With us," said Mr. Moody, "the insect question is settled; I care nothing more about insects in our orchard, They can be easily destroyed at slight expense, and at a time too when the poison used does no harm to fruit or trees."

Prof. C. V. Riley, at the American Pomological meeting, exhibited a cyclone nozzle recently invented by him for the benefit of the public, to use in spraying trees. It throws an infinitessimally small spray with great force all over and under the leaves and branches at once. He recommends a kerosene emulsion for general use as an insecticide, as it has the additional virtue of killing the scale insects which ordinary insecticides will not destroy. His formula is one quart of milk to two quarts of kerosene, churn seven minutes, dilute the butter with forty parts of water. For tree work he uses a bambo pole with rubber tube inside and the nozzle on the end. Common soft soap mixes well with kerosene, churn the same as with the milk mixture, and dilute the butter with rain water. This kills the red spider.

Dr. E. L. Sturtevant's experiment with hens in his plum orchard is described elsewhere.

Hon. William Saunders, at the U. S. Agricultural Department, explained to me in September last, a successful experiment in tobacco stems in dealing with the grape-leaf hoppers in his green-houses. The stems were strewed upon the ground under the vines—occasionally sprinkled to keep them moist, and the vapor arising from the tobacco kept the insects entirely out of the premises. Prof. Riley says this vapor is less injurious to delicate plants than either the smoke or the liquid of tobacco. G.

THE TARNISHED PLANT BUG.

(*Lygus lineolaris*, beauv.)

BY PROF. S. A. FORBES, OF NORMAL, ILLS.

[From the Farmers' Review, Chicago, Feb. 23.]

There are few insects which are capable of greater mischief to the horticulturist than this, and not many whose average injuries reach a larger sum during the season, equally at home, as it is, in

the vegetable garden, the fruit field and the nursery. It has hitherto seemed one of the most difficult to deal with on the books of the economic entomologist, and those who have had most experience with it have had least hopes of combatting it successfully, but some recent experiments, made with a view to arresting its ravages in strawberry fields, have resulted favorably, and I think that it can be brought under economical control.

DESCRIPTION.

It is a hemipterous insect, and consequently has a pointed beak, with which it pierces the tissues of the plants upon which it feeds, but cannot "bite," in the proper sense of that word. This is a fact, of course, to be borne in mind in discussing modes of attack upon it.

The adult, or winged form, is about a fifth of an inch long, by half that width, oval, yellow, or greenish yellow, and more or less striped or mottled with dusky brown. It is extremely variable in color, but the most constant marks are five longitudinal white lines on the thorax (often reduced to spots, which then occupy the front margin), a white y-shaped mark on the scutellum, which is sometimes broken into other white points arranged in a triangle, and a white blotch, tipped with black, near the end of the wing covers.

The young are much less variegated than the adult and more distinctly green. In all but the first stage they may be distinguished by the presence of five black dots upon the back, arranged in a pentagonal form.

HABITS AND LIFE-HISTORY.

The old bugs winter under rubbish upon the ground, emerge early in spring, cluster upon the unfolding buds of fruit trees, the fresh foliage of strawberries and other early vegetation, and there lay their eggs, old and young together, draining these succulent, growing parts of sap. The effect is to arrest the development of the leaves, and even to wither and kill them, so that in an infested nursery the young trees will look as if scathed by fire. There is considerable reason to suppose that these insects are often active agents in conveying the virus of the blight of the pear and apple from tree to tree by inoculation with the infected sap. The strawberry, the raspberry and the blackberry are all attacked, the first

much the most seriously. The bugs pierce the young berries and suck the sap, thus causing in the strawberry, at least a part of that withering and knotty hardening of the berry known to fruit growers as "buttoning." The crop is often diminished from one-fourth to four-fifths in yield and value by this injury.

The potato, and other succulent garden vegetables, often suffer from the depredations of this insect; the leaves and tips of the stems withering and turning black under the punctures of its tiny beak.

There are at least two broods in a year, one maturing in May and June and another in July and August, and it is possible that there are still others subsequent and intermediate. There are four stages between the egg and the winged form, each corresponding to a moult, or shedding of the outer crust.

REMEDIES.

This abundant and widely distributed species, occurring on a great number of plants, and throughout nearly the whole season, one would suppose to be especially liable to destruction by natural enemies in great varieties, but, unfortunately, this does not seem to be the case. Although a very few are eaten by birds, no natural enemy is known to have any appreciable effect upon their numbers, but there is some evidence that wet seasons are injurious to them.

The wide-spread occurrence of the species at all seasons of the year, the great variety of plants, both tame and wild, to which it resorts for food, the rapidity with which it breeds and the activity with which it flies from place to place, make any other than restricted measures against it quite out of the question. That is to say, there is little use in trying to diminish its numbers at large, unless a general clearing up and burning of rubbish late in autumn, might possibly contribute to that end.

The attention of the orchardist and gardener, whose fruits and vegetables are threatened by this insect, must, therefore, be turned rather to measures for defending directly the crops endangered.

Four methods of procedure have been found effective. When on the twigs of trees, it has been proven profitable to shake the bugs off in the cool of the morning, when they are sluggish, into buckets of soap suds or into water upon which a light film of kerosene has been poured. A more rapid and equally effective method of capturing them is to sweep or beat the twigs or other parts of plants

upon which they are gathered in the cool of the day with an insect net, occasionally inverting and shaking this over a bucket of water and kerosene. Two topical applications have been found deadly to them, one of them especially so. A single dusting with pyrethrum (or Persian insect powder) has been found sufficient to kill eventually every insect exposed to it. This may be used either mixed with ten parts of flour, or suspended in water and sprayed or sprinkled on the bugs at the rate of about fifteen grains of powdered pyrethrum to the pint of water. As this substance can now be had from the importers for about forty-five cents a pound, it is well within the limits of economical use for the protection of horticultural products.

The kerosene emulsion, made by a thorough churning of equal parts of kerosene and sour milk until a permanent cream is produced, is almost, but not quite equally efficient. For use, it should be thoroughly mixed with ten parts of water and sprayed or sprinkled on the plants.

A full and elaborate account of this insect, illustrated by figures of all its stages will be given in the forthcoming report of the state entomologist of Illinois.

PROF. BURRILL AND MR. PEFFER ON BLIGHT.

In the Horticultural number of the *Farmer's Review*, of Chicago, published February 28, 1884, is an article on Blight, by Prof. T. J. Burrill, of the Illinois College of Agriculture, in which the immediate and active agency producing the disease, that which causes the changes in the tissue of the wood and bark, is described as "a living, self-multiplying organism classed among the *bacteria*, or, as often inappropriately called, 'disease germs.'"

Professor Burrill says: "There is absolutely no doubt of the truthfulness of this statement. Hundreds of persons have seen the destructive little things through microscopes of high powers, and wherever the apple and pear blight is in progress they can always be found in great numbers. The disease is easily produced artificially by inoculation—taking the organisms from infected trees and putting them in the living bark of healthy ones, by the aid of a pointed knife or needle. When thus introduced the bacteria destroy the contents of the living cells without attacking the cell walls; a kind of fermentation is set up and the part is killed. In

the meantime the bacteria increase prodigiously in number and gradually spread to the surrounding cells, passing through the structure by means of their own, rather than carried by the movements of the sap. Progress is always slow, rarely more, under the most favorable conditions, than half an inch per day (twenty-four hours), in young growth—much slower in older bark. In the trunk of one apple tree, carefully watched after an inoculation, in June, the organisms remained in an active state eleven months and only spread during the time four inches.

After noting the fact that certain varieties are less subject to blight than others and that certain soils and exposures are more favorable than others to resist it, he recommends remedial efforts to exclude the bacteria from the trees: "It must be understood that the disease always starts in some part of the top of the tree, never in the roots; and the disease agents come from without, never from the inner tissues. On the stigma (end of pistil or young pod) of the flower they enter the cells without the necessity of a wound, for there is no protective covering here like the epidermis or bark. Whenever, however, the living cells are covered by a coating of corky tissue, like the dead outer bark, or by an unbroken epidermis or skin, the bacteria can not gain entrance without mechanical help in the way of a crack, a puncture, or other wound. Though the disease is readily transferable by inoculation, no results ordinarily follow tying a badly blighted limb among the branches of a healthy tree."

Hence if his meaning is understood correctly, if there is no rupture of the bark by a diseased condition of growth, or by outside injury, no openings made in the cell structure, the bacteria cannot enter except through the blossoms as above stated. The first remedy, therefore, as recommended by Professor Burrill, is to maintain a healthy, constant, but moderate growth of the tree, especially in the early part of the season, that the wood may become well ripened and less liable to rupture from climatic causes. 2d. To prune early in the spring, before the buds start, if any pruning is necessary, and all wounds more than three-fourths of an inch in diameter to be covered with linseed oil and lead paint. 3d. To wash with a strong alkaline solution at least once a year to keep the bark smooth and clean, results useful in themselves, but especially useful in aiding us to detect blight in its first infection. 4th. To carefully remove all affected parts as soon as discovered, cutting far enough away from the discolored parts to make sure against inoculating healthy tissue by carrying the bacteria on the knife;

in fact he recommends using two knives in the operation, one in trimming off the diseased wood and the other in the lowest paring.

In a previous paper Professor Burrill has described the bacteria, if memory is not at fault, as being so small that 250 of them could stand in line across the edge of a sheet of writing paper. This being true, it is suggested that a safer rule is to paint or wax all wounds made in pruning, no matter how small.

MR. PEPPER'S VIEWS.

Geo. P. Pepper, of Pewaukee, in the same number of the *Review*, has an article upon blight in fruit trees, in which some other ideas are advanced, differing in part from those of Prof. Burrill. He admits that blight may ensue from either of the following causes: 1st. Pressure of sap through the stomata of the young leaves and new wood. 2d. Punctures by insects. 3d. Rupturing the cell structure by freezing and thawing; electricity or electrical conditions of the air; all these causing fermentation of the sap, inviting bacteria, and, when decay sets in, fungi. He admits the theory of bacteria to this extent, but finds another prevalent cause when no bacteria, in his opinion, are present; and that is in the early spring when the evaporating surfaces of the trees are largely increased by the opening blossoms and stimulated by high temperature. Then if there are stoppages in the wood cells, occasioned by any kind of injury to the structure of the newer wood or the last year's cambium layer, the upward flow of sap is interrupted, and the leaves and petals and all other surfaces of the blossoms dry up and wilt for want of moisture from below to supply the waste by this excessive evaporation. The leaf turns dark and finally black, the rotten sap or poisonous fluid runs down the petal to the calyx, along the little apple, then the stem of the little apple to the base, where all the fruit stems started out of the flower-bud, and then all are affected, if they had not been before. On most of the apple trees it only runs down to the old wood and stops there, while on crab or pear it is apt to run down the older wood, and so extend until the tree is killed. Here Mr. Pepper thinks is a case where the bacteria or fungi are not the cause, though they may set in as soon as fermentation and decay begin, and aggravate the disease.

"A few years ago," says Mr. Pepper, "we experimented on apple blossoms, and observed that the petals on the flowers wilted during the day when the trees were about in full bloom, but before they would naturally drop off. (We had at the time a southwest wind,

and the thermometer ranging from 90 to 96 in the shade). They did not recover or straighten out during the nights, and we found on close examination they were scalded or burned, as it were, and in a few days looked like fire had run through them, from this blight.

Trees that had no blossoms open, or had no blossom buds to open, were not in the least affected neither then or during the summer—only those that were all out in full bloom on those three hot days perished.

It looked to me, then, that so much surface of so much bloom and leaves were not supplied fast enough with sap, to allay the evaporation going on during the time, to keep the petals from wilting or scorching."

He recommends two remedies that are substantially the same as Professor Burrill's, namely: 1st. "Remove the affected parts as soon as possible by cutting off the limbs a little below the colored sap under the bark, or cut off where it is sound and healthy, and immediately paint or wax the wound. 2d. Mulch the ground under the tree or have a crop of clover or grass, or any other crop that will shade the ground, thereby controlling sap circulation," but adds another: "Plant trees when quite small, or better still, plant your seeds where you want your trees to stand, so the main roots will go down deep into the subsoil, thereby retarding and equalizing the new wood growth, so that a sudden change of air will not stimulate overgrowth. This mode is particularly advisable for planting the pear.

G.

THE OBJECTS OF THE STATE EXPERIMENTAL FRUIT FARM AND WHAT IS BEING DONE.

The chief object to be obtained is the development of long keeping apples, as hardy in tree as our most hardy iron-clads—the iron-clads all being summer, fall, or early winter. And it is with pleasure I relate the success thus far attained in the development of the objects sought.

We began work on the State farm five years ago the 20th of last April. We had to clear the land of a dense growth of timber; then plow, plant, and fence; all of which was done by the evening of the 6th of May—762 crown and root grafts set. For we had no trees of the variety we wished to set in the orchard, and so used

root and crown grafts, worked on one and two year old seedlings, and set a stake to each to mark its location. The stand was good except where the ground was hot from the burning of brush and logs. And so good the growth and so soon into bearing that if ever I was going to set another orchard I would prefer root-grafts to three year old trees, as they would be about as large in five years as the three year olds, and no black-hearts from the back-set of transplanting, as is often the case with large trees. From this orchard we have gathered two crops of apples, about eight bushels each, aside from what was stolen. The apples were cut and seed planted, and from these we have now a good stand of one year old trees, which will be ready for delivery in two years more. And then the Regents of the State University will say what disposition will be made of them. I grow the seedlings until three years old, then select such as bid fair to produce good fruit, and send out as directed by the Regents.

The experimental orchard is for the growing of seeds, from which to grow new varieties that will stand our climate, and of best possible quality—mainly long keepers, and the way we expect to do it is by cross fertilization of such long keepers as we can make stand long enough to produce one crop or more, with our most hardy, such as we term iron-clads. This cross-fertilization is done when in bloom, by the flow of pollen from the bloom of one variety into that of another, thus causing the seed of the apple that comes on that impregnated bloom to produce a variety differing to a greater or less extent from any variety in the orchard. With us no two seeds from the same apple ever produced fruit or trees exactly alike, so varied are the degrees of crossing; even in the same bloom, no two stamens are fertilized exactly alike, therefore no two seeds will produce alike, for each seed has its own stamen.

And to make the crops more certain we plant the trees close together, about eight feet in the row, and the rows twelve feet apart, and every alternate tree a long keeper, the iron-clads between, thus making it easy and sure for a natural flow of pollen to fertilize each bloom to a greater or less extent, and then to save the seed from the long keeper, we are sure of some seedlings that in hardiness of tree will partake of the iron-clads, but in time of ripening the seedling will follow the parent apple from which the seed was taken. Such at least, are facts so far as our experimentations have developed, and we have had about a thousand seedlings in bearing, and only in three instances have they varied over three weeks in time of ripening from the parent apple from which

the seed was taken and those three only from four to six weeks, though the crop was often made with varieties differing widely in seasons of ripening. To begin we had no data from which to start. It was test and try, solve our own problems, as to what to use and where to get it, and how to use it afterwards. And now with a good selection to start with and a knowledge how to use it, we are fairly started in a pursuit for more and better, and the past is a guarantee that our most sanguine hopes cannot prove a failure. That all the seedlings will prove hardy is not expected, nor is it expected that all the hardy ones will produce first-class apples, but we anticipate a better yield of good varieties than ever had before, from the fact that none but good varieties are set in the orchard; nothing there to adulterate as was formerly the case.

But it may be asked, why not all the seedlings prove good? In answer I would say, our iron-clads are all a mass of mongrels, the good are a selection of the best from a promiscuous mass of crosses, and inherent in the nature of all mongrels is to run back to originals, hence under the most favorable circumstances there will be more or less running back toward the original Siberian crab in fruit as well as in tree. In fact the hardness of the crab tree is what we want in the cross, with the size and quality of fruit of the best of our choice large apples, with just enough of the commingling of the crab qualities to give a peculiar lusciousness, whether to eat from hand or in sauce, that no other apple has. Therefore not far distant in the future we anticipate a full supply the year round for the Northwest, and of better quality than any yet on the list. The Wealthy was from the seed of the Little Cherry crab, an accidental cross with some larger apple, getting the hardness of tree from the crab, and the size of fruit from the large apple, and in quality, a commingling of the best qualities of the two.

Certain the Wealthy when made into sauce, it is crab, and not surpassed nor equaled by any except some of our crab crosses. Hence our unwavering faith that still better may be produced by the process of crossing and recrossing, ever retaining the best, and culling out the more inferior.

We once planted seed from a crab tree that was surrounded by Blue Pearmain trees that were in bloom at the same time of the crab from which the seed were taken, and the result was no two exactly alike in tree or fruit in a lot of 250. Some showed Blue Pearmain in tree and leaf, yet hardy as a crab, whilst others were crab in tree and leaf, yet occasionally one too tender to stand a hard winter, the fruit varying in size from large to very small and

from first-class to worthless, regardless of size. And later we grew another lot of seedlings from the same tree, the surroundings not so good, the Pearmain having died in the time, and not one in ten proved hardy, and not one of the hardy ones produced a good fruit, showing that a good cross in the apple, like in all else, is sure to tell for good, and accordingly the selections were made for the State orchard, and they who get the trees will chance of something new and nice.

Then aside from the seed growing orchard, we have another on the State grounds of about 500 trees, set with choice seedlings to stand until they bear fruit, to see what the fruit may chance to be, and from it we anticipate something extra.

Also have a pear orchard that at one time contained about 500 trees—less than 100 left, and the success of those not very flattering, yet I have hope of successful pear culture in Minnesota, but that hope is in the Russian pear that I am getting from the Iowa experimental grounds. They have stood without the loss of a bud where our most hardy ones, side by side, same age, killed to the same snow line, and with those Russians I shall refill the grounds in full faith of success; and also anticipate setting another apple orchard on the grounds, composed entirely of Russians from the Iowa experimental grounds.

The grapery on the State grounds contains about 2,000 vines, mostly in bearing, comprising some 50 varieties; and from seedlings, from seed of our own growing—some first quality, but a large majority worthless.

And of the raspberries on the State grounds, the Gregg and Cuthbert do the best. The Turner is not there, but on our own it is all that could be desired in a berry—a luxury that every family should have.

Of strawberries we have a great assortment, and another year can say better than now what is best.

PETER M. GIDEON.

Excelsior, Minn. Dec. 18, 1883.

REPORT OF DELEGATE TO THE MISSISSIPPI VALLEY HORTICULTURAL SOCIETY.

Mr. President and members of the Minnesota State Horticultural Society :

Through your kindness I was made a delegate to the meeting of the Mississippi Valley Horticultural Society held at Kansas City, Missouri. With me the trip was one of pleasure, honor and usefulness combined, for which I shall ever feel under obligations to our own State society, that I have ever taken such an active interest in.

Between here and Kansas City lie hundreds of miles of rich and beautiful country, checkered with railroads in all directions, with hundreds of flourishing villages and towns, with fine school houses and churches, which express more than words the morals and enterprise of the inhabitants.

Missouri is the handsomest country I ever passed over; abundance of good timber and water, and good soil; a climate that grows corn, sweet potatoes, apples, pears, cherries, peaches and grapes in great abundance. In the middle of the winter no snow on the ground; sheep, cattle and horses getting their living on blue grass or feeding in the stock fields; hogs fat from following the cattle or eating what was left in the corn fields. A live true-blue yankee in *time* would become indolent and lazy in a climate like this.

Kansas City is a live place, greatly favored by railroads and by steamboat navigation. Situated in Jackson county, Missouri, at the junction of the Kansas and Missouri rivers, she has a large trade in hogs, sheep and cattle, also in apples.

The members of the society were well entertained at the hotels at \$2 per day. Twenty four states were represented at the meeting. It was the most intelligent gathering I ever attended. The papers and discussions were all first class. A paper was read by ex-Governor Robert G. Furnas, of Nebraska, giving a description and estimate of the timber west of the Rocky Mountains, which was listened to with much interest.

A very important paper from Prof. J. L. Budd, of Ames, Iowa, was read: "The Fruits and Climate of Northeastern Europe," which showed conclusively that from that section of country we can get good varieties of cherries, plums, pears, and apples that will stand in this country.

A paper on strawberry culture by J. H. Hale, of South Glastonbury, Connecticut, attracted much attention, especially for its treatment of the subject of the blossoms.

"The Trunks of Apple Trees," a paper by Prof. T. J. Burrill, of Champaign, Illinois, took the ground, from the form and position of sap cells, that if the wood was ripe no fear need be entertained of the cold killing the trees; further that drouth and bacteria were the principal causes of the failure of orchards.*

Prof. S. A. Forbes, in his paper on insects affecting the strawberries, continued his valuable report in this line of research, so ably begun at the meeting of this society last year.

About forty papers were read on various and important subjects, and those that wish to read them can procure a printed copy of the proceedings of the society in full by sending \$2 to the secretary, Prof. W. H. Ragan, LaFayette Indiana. It will be money well invested. The fruit exhibition was very fine. When my eyes rested on the long tables of fruit, the thought came to me, is it possible that Minnesota took the Wilder medal, with such a display of fruit as this to contend with—for here were the same men and fruit that represented Missouri at Philadelphia? But when the meeting was over and I had the privilege of sampling all the fruit the matter was plain. Missouri and Kansas can grow apples, pears, peaches, cherries and grapes in almost endless quantities, but Minnesota in quality and beauty of her fruit will come out ahead. Kansas and Missouri are natural fruit belts, but from some cause unknown to me, they do not grow the best varieties of apples, and I might add small fruits. Ben Davis, Geniton and Willow Twig are the leading varieties. The Baldwin, Greening and Bellflower are failures. The Thwack and Mammoth Cluster raspberries are the two leading varieties. The Cuthbert, our best in Minnesota, with them is a failure.

The best apple I found on the tables for long keeping, beauty and quality, was the York Imperial.

I procured cions of about twenty-five varieties of apples, new to Minnesota, for trial.

M. PEARCE.

* NOTE ON FOREGOING REPORT.—Our delegate neglects to state that he got in his speech about ripe wood never winter killing, and about drouth in fall doing more mischief to fruit trees than cold winters, ahead of Prof. Burrill, and provoked the professor to inquire what should be done with a man who steals another's thunder. The inquiry was a high compliment to Mr. Pearce.

FRUIT REPORT FROM OLMSTED COUNTY.

CHATFIELD, Minn., January 11, 1884.

My orchard has made a satisfactory growth the past season; not more than two out of seven hundred trees have died. The location is a north-east slope, with clay soil, trees planted in 1876; cropped to corn and potatoes till 1881, then seeded to clover. Last year I pastured the orchard with about seventy hogs. This keeps the grass down, and leaves no shelter for mice; everything grown on the ground except the fruit is returned to it.

A history of my orchard may at this time be useful to the public. My trees were obtained from P. A. Jewell, with whom I had, in his day, many an evening's talk on fruit raising, and from whom I obtained some good ideas, which I have put in practice. The trees he furnished me were true to name, and not black-hearted. This was a good starting point. I set in new ground, after the first crop; distance twelve by sixteen feet. This is far enough apart in locations exposed to high winds. If the trees should prove to be too close in the future, one could go through the orchard after the manner of young George Washington and apply the hatchet to a few of the poorest, which would have paid for themselves many times over already, besides protecting their companions from many a stormy blast.

I consider my orchard as I do my live stock, the greatest reward from the best care; feed my trees as I feed my cows; have taken into the orchard an average of forty loads of manure per year for seven years. I could not now draw all the wood out in forty loads; besides it has already yielded me more than twenty loads of apples.

The Duchess is a perfect success. I had them last year perfectly sound till October. The Wealthy, though not so hardy, is doing well, and bears abundantly. I have a goodly number yet, which we find very palatable these cold wintry days and evenings. The Wealthy is an excellent fruit. The Walbridge we find in this part of the state about the same in wood as the Wealthy, though not so good a bearer when young; but we kept the fruit last year until May, and could have kept it till July, only the supply ran out; a very good pie apple then, not bad to eat, but rather too much acid to suit the taste of most people. The Minnesota we find not a good grower, but a good keeper. The Fameuse keeps well with us till February or March. The Orange we have yet in perfect con-

dition, but it soon perishes when exposed to dry air. The Tetofski with me is one of the hardiest, but this goes to show that all trees are not alike adapted to the same kind of soil and treatment, as but few can raise them in this vicinity with success. Early Strawberry perfectly hardy, and a good bearer. Meaders Red Winter, if true to name, small, red, scabby looking fruit, tree hardy, but fruit no keeper; fit for nothing but cider or vinegar; used immediately from the tree in order to save it. Price's sweet, tender in tree, but fruit excellent; Beecher Sweet, *vice versa*.*

I do not consider it necessary to go much further into details of the kinds of fruit in my orchard, as many of them are experimental as yet. I have no russets that are hardy, except one seedling; do not know how this winter may use it. I have several other very promising seedling apples yet on the trial list.

The prospect for a crop of fruit this year is good.

Now a word in regard to mulching fruit trees. In my opinion the time to mulch is when the ground is frozen enough so as to not easily thaw out, then the mulching will hold the trees in check in the spring, and save the crop from late frosts. Two years ago I am sure I saved two hundred bushels of apples by having my trees mulched, the blossoms being backward. One of my neighbors burned straw all night in his orchard, but did not save his fruit.

My trees were loaded with apples; his nearly bare; yet our trees were bought of Dr. Jewell at the same time; planted at the same time, on the same slope, the orchards being not more than forty rods apart. He was fully convinced that my mulching saved my fruit. I do not pile up near the trunks of the trees as many do, but spread the manure around three or four inches deep and four or five feet away from the trees. I keep it solid, as well as the snow, by tramping, so as to leave no soft places to harbor the mice. Have never lost a tree from the mice. In plowing in the fall, the earth is thrown up to the trees, so that they all stand on ridges. This prevents the accumulation of water around the trees, which I think in many cases is the cause of the bark cracking at the ground, and killing the trees. In such cases the injury comes from the water running in and freezing in the vacant space left around the tree just below the surface of the ground, caused by the swaying of the tree to and fro in the wind while the tree is young and not strongly rooted, the freezing of the water swells it and bulges the bark loose, which is sure death to the trees. Some people fail to see the cause of injury here, because there is life

*Probably not true to name, for Beecher Sweet is both hardy and good.—SECRETARY.

enough left to start the sap upward; the buds swell; the trees leave out; but then they sicken and die in midsummer, and the fault is laid to the trees themselves, when it was only in the management of the orchard. One cannot be too careful in setting; and after setting we cannot be too careful out here on the prairie to prevent the wind moving the trees back and forth; not only because of the danger from ice in the winter, but from the dry air getting in among the fibrous roots and killing them by drouth in the summer. We should look at our young trees often in the summer, and if we find these vacant spaces around the trunks, caused by the trees swaying in the wind, fill them up, and keep out both dry air then and ice in the winter.

My wife tells me to say one good word for the Meader's Winter; that it is the best apple we have for jelly—juicy and tart—just right.

I am sorry not to be able to meet with the State Horticultural Society. As I am alone on the farm, it is not always possible to go away. But I am interested in the proceedings of the society, and hope what I have written may be accepted in lieu of better services which cannot now be tendered.

J. D. RINDERKNECHT.

WINONA COUNTY FRUIT REPORT.

STOCKTON, January 8, 1884.

So far trees, plants and vines seem in good health for a crop of fruit this year. The apple crop of 1883, was not very large, still what was raised brought good prices; Wealthy being sold for \$2 per bushel, in a small way, as but few are yet raised. My own orchard being young I raised but little fruit and what there was, was mostly whipped from the trees by the wind at the time of the Rochester tornado. I had several seedling apple trees with few apples on for first time, but the storm seemed to have a spite on them, so I cannot say how good or how bad they were, but think the good was ahead. I have been around to the different orchards near me and as a general thing they show neglect. To the careful, energetic fruit grower I can see a bright future. Who is to reap the harvest if no sower sows the seed? Surely the demand for prime fruit is far ahead of the supply. Some say that they will sow one acre to grain and take the proceeds and buy Michigan

apples year by year; but what if our Michigan friends fail to raise fruit to spare? My response is, as a Michigan friend told me last spring, "Minnesota can, does and will raise better apples than they do south and east of us. But it takes work to do it."

For our county, Wealthy, Dutchess, Utter, Telofski, Fameuse, Golden Russett, Talman Sweet, Red Astrachan, Orange, Transcendent and Hyslop seem to take the lead. Of grapes, Concord, Delaware and Janesville. Of raspberries, Turner, Philadelphia. I am experimenting with Seedling black caps. Have one very good one. One of the best to can and will prove a No. 1 in *all* points, I think. Its own seedlings seem to be good, also so far as trial. As to strawberries, with me Capt. Jack, Crescent and Green's Prolific, pay best; while in the valley below me Capt. Jack is prone to run too much to vine. Hart's Minnesota leaf-blight. So we must plant what does best on our own soils. Have not seen any insect enemy on the strawberry plants in our vicinity.

Of twenty kinds of potatoes on trial in 1883, I like Rural Blush, Late Beauty of Hebron, Tioga, American Giant, Manhattan, Early Ohio, Belle and Bliss Triumph, the best. I have a white sport of the Manhattan of my own raising, which on one year's trial seems good.

Gregory's Danvers Carrot and his Early Red Globe Onion were splendid.

W. K. BATES.

FRUIT REPORT FROM HOUSTON COUNTY.

The fruit crop of last year in Houston county was unsatisfactory, and the season will long be remembered for its many peculiarities. Apparently fruit trees and plants entered upon the last winter in the most favorable condition, and the soil although not saturated with water was not dangerously dry. Winter set in about the 7th of December, when the thermometers marked 20° below zero, and continued below two or three days. This was followed with fine weather, frequently above the freezing point, until the 31st, when the mercury decreased to 10° below. During the following sixty days the thermometers indicated below zero the greater part of the time, and more than once from 20 to 30 below.

The snow fall was of unusual depth and remained upon the ground until April. The spring following was cold and backward, and marked by frequent frosts until near the first of June. The

snow disappeared gradually without rain or the usual spring freshets, and potatoes that were not dug in the fall survived the winter unharmed. The destruction and injury to fruit trees was considerable in many orchards, and more especially in valleys and upon low lands in sheltered localities. In some instances the hardiest varieties were injured as much as the more tender, and the greatest fatality was to trees set the previous spring. I should estimate the permanent damage to the trees about fifteen per cent. and the killed outright about six per cent. Upon elevated ridges the injury was the least.

There was a general blossoming of all of the orchards, and even trees that soon after died outright, put out leaves and bloomed. The bloom of apple trees generally was not as plentiful as the previous year, but enough for an average crop of fruit. Several frosts occurred in May, and a severe one upon the morning of the 21st, but a careful examination did not show the immediate damage to be very great. The fruit set liberally and commenced enlarging, but early in June many trees began to present a sickly appearance and upon some varieties a large proportion of the fruit prematurely dropped, and that which remained to ripen were generally inferior to other years. The fruit was unusually exempt from the codling worm, but the injury by the apple curculio was greater than ever before noticed, and by fall there was but a small percentage of perfect apples left for the grower. I estimate that upon my place seventy-five per cent. of the Duchess and Willow Twig were punctured, some of them so badly as to be hardly recognizable, and unless some means is found to head off the Little Turk, the growing of the Duchess and Willow Twig will have to be abandoned. The varieties that produced the most fruit were the Early Strawberry, General Grant, Orange, Hyslop and Transcendent crabs, and the Duchess Tetofski and Cooper apples. The Walbridge, St. Lawrence, Talman Sweet, Fameuse and Plumb Cider fruited very heavy the previous year, and we did not expect a large crop from them.

Strawberries did not average more than two-thirds of a crop upon the best beds, and some plantations were nearly a failure. They wintered well, and promised for a time to be the heaviest crop ever grown here. The earliest settings were blackened by the frost of May 21st. An unusually heavy rainfall in June greatly damaged the remainder. Gooseberries and currants were much less than an average crop. Raspberries, the Doolittle were a little more than a half crop; the Gregg about one-fourth; Turner, about two-thirds.

Had the grapes all ripened, there would have been about three-fourths of a crop of Concords; the Delawares not more than half a crop. The Rogers and Delaware suffered from rot and mildew.

The first grapes to ripen were fifteen days later than usual, and twenty-five days later than in some seasons, and in many places the entire crop was destroyed by the early frosts. The September frosts did not injure the vineyards along the Mississippi river, so that about 60 per cent. of the crop was secured.

The crop of native plums, both in quantity and quality, was the worst ever known here. I am testing the Worden and Moore's Early grapes, and find the vines as hardy as the Concord; the fruit as good and a few days earlier in ripening.

I believe the Janesville to be valuable where the Concord will not ripen.

There are growing in this county :

Apple trees, growing, (1862).....	24,745
Bearing trees, bearing (1882).....	11,629
Bushels of apples produced in 1882.....	1,234
No. grapes vines bearing in 1882.....	58,859
No. lbs. grapes produced in 1882.....	45,243
No. vines bearing in 1883.....	86,099

During the summer I have visited orchards in various parts of the state and have not found any locality where the trees were injured more severely than in this county and generally the crop of fruit produced was better in proportion to the age and size of the trees. The Siberians, Duchess and other varieties were larger and fairer in the counties west of us for 200 miles, and by examination made I find the trees were less injured last winter.

JOHN S. HARRIS.

LaCrescent, Minn., Jan. 1884.

GENERAL FRUIT REPORT FOR ROCHESTER DISTRICT.

We think we have two good reasons for not making a very favorable report for this station, viz: 1st. It is what is pretty generally conceded to be the off year in fruit culture. 2d. You probably learned that on the 21st day of August we had what is called a tornado. This took the most of our fruit off before it was fairly matured, and had it not been for our early Russian varieties, the

most of which were ripe at the time of the tornado, we should have been in much worse condition. We fruited one hundred and three varieties in all, including forty Russian sorts. The best bearers of summer were Duchess, Early Champagne and Tetofski; fall, Wealthy, Hass and Cooper; winter, Rollins Pippin, Elgin Beauty, Pewaukee.

R. L. Cottrell sold fruit to amount of \$225, a good showing for 1883, but not equal to 1882. E. B. Jordan is one of the most extensive fruit growers in the state, but we have not been informed as to the number of bushels produced. We understand that he sold fruit to the amount of \$3,000, the past season. M. W. Cook, \$900; M. J. Hoag, \$790; E. Leonard, \$300. There was a large amount of fruit raised in my senatorial district, but I have not had time to gather in the statistics. The strawberry and raspberry crop was all the most selfish natures could ask for. Gooseberries and currant crop but moderate. We fruited this past season for the first, a new seedling raised from the Houghton by W. O. Crittenden of Dover. The fruit is a size larger than its parent, and we think better in quality. We think it bids fair to supercede both the American and Houghton seedling gooseberry. Owing to early frost grapes were almost a failure.

A. W. SIAS.

Neglected to state at the proper place that the Wealthy stands head and shoulders above all other early winter varieties, and that Wm. Somerville, one of our most successful fruit growers, says he has raised fifty bushels from one hundred trees, six years old.

A. W. S.

FRUIT REPORT FROM THE OWATONNA DISTRICT.

The past season has been a very trying one to the fruit interests of this section of the state. And the question of variety was never of more vital importance than at the present time.

Heretofore we have had hopes of several varieties of standard apples, but now we have come to regard the Tetofski and the Duchess as the only well known varieties that can be planted here with a fair prospect of success. With the former this did not seem to be the bearing year, whilst the latter would have produced a good average crop but for the heavy wind of July 21st, which almost entirely destroyed the fruit and ruined many trees.

Our worst fears are being realized in regard to the Wealthy. On account of its early bearing and magnificent fruit we had hoped until quite recently that it would at least pay the cost of cultivation, but its dying proclivities seem so great that we have resolved to *plant no more*.

The crops of crab apples and plums were very materially diminished by a severe late frost. And it may be regarded as a singular fact that they are more susceptible to injury by late frosts than Duchess and Tetofski.

We hear of winter seedling apples scattered over the country, and there can be no doubt that the liberal premiums offered by our society will bring out something of great value to our state.

Many varieties of crab apples which have been highly recommended are worthless or nearly so to me in orchard. And I am the more confirmed in the opinion that no variety of apple or crab should be recommended by our society without *thorough, varied and prolonged* orchard tests. And that our apple and crab lists would become more reliable if a greater number of orchardists widely dispersed and fewer nurserymen were engaged in their revision. Not that nurserymen are less trustworthy, but they sometimes fail to see the true inwardness of the stock they have to sell.

Small fruits have been nearly a failure—strawberries producing hardly half a crop, with Crescent at the head for profit; and grapes usually failed to ripen before frost.

I very much regret that facts do not warrant me in making a more cheering report at the present time, but I promise if I live a hundred years I will do my level best to help beat the elements and make Minnesota a No. 1 fruit State.

E. H. S. DARTT.

REPORT OF SEEDLING FRUIT COMMITTEE.

During the last year I have spent considerable time in looking up seedlings and new varieties of fruits with a view to finding such as may prove hardy and worthy of propagation and dissemination in this state. It being an off year for fruit, I am not able to make a very definite report upon the value and quality of some of the varieties. One of the trees of Wm. F. Dunbar, of Caledonia, Houston county, mentioned in my report for 1883, appears to be about

as hardy as the Duchess, fruit of medium size, a good keeper, but No. 2 in quality. The tree of Philip Everhard, of Mound Prairie, Houston county, which produced thirty bushels of apples in 1882, stood the test of last winter and bore some fruit in 1883. The fruit is not No. 1 in quality, but as good as most of the Russians; is about the size of the Fameuse, and keeps well. J. C. Kramer has several varieties, the trees of which appear to be hardy. They bore but little last season, and he informs me that the fruit was not as fair as usual. Some four varieties of them are upon exhibition at this meeting. I found several seedlings still remaining in apparently good condition in the orchard formerly owned by Mrs. Campbell, Minnesota City. One variety of sweeting strikes me as being of superior quality and worth looking after. James Wright, of Minnesota City, has one tree thirty-one years old and over one foot in diameter that has never been injured by winter killing or blight, and is a regular bearer of a fruit that in size, shape and color somewhat resembles the Bellflower. Some of the specimens are perfect pear shape. The fruit is a fair keeper and valuable for cooking purposes. Mr. S. Bates, of Stockton, has one or two promising varieties which he has agreed to show at this meeting and report upon. I have located other trees in various parts of the state, and should the coming season be favorable for a crop of fruit, I hope to find something worthy among them. Of the Rhodes Seedling, of Trempealeau county, Wisconsin, Mr. Wilcox writes: "The seed from which this variety originated was planted by Mrs. Rhodes while a maiden, some twenty-eight years ago. The tree is standing in a burr oak soil, land level, and other apple trees, not only on Mr. Rhodes' place but for miles around, except crabs and Duchess, are not a success. It is not subject to blight, has borne twenty bushels a year, as is claimed, for several years." He says: "I helped to measure it last July and found the trunk near the ground five feet in circumference and the spread of the top 37 feet in diameter. It is also well adapted as a stock for top-working Fameuse, Utter, etc." He further says: "We are trying in orchard many seedlings, among them two from De Soto, one from Dodge county, Minnesota, and some from this county. I found one promising looking tree at Mr. Dartt's, and several in Olmsted county which I expect Mr. Sias will report upon." From the result of observations made I am led to believe that we are on the right track, and that we shall yet find or originate varieties that will fill the bill.

JOHN S. HARRIS.

La Crescent, Jan. 16, 1884,

REPORT ON SEEDLINGS.

Webster says: "Caution is the armor to defend us against imposition and the attacks of evil." And after being most outrageously imposed upon for the last quarter of a century by people palming off varieties that would not stand even 60° below zero, I thought it about time to be a little more cautious, and so concluded to take with me hereafter the very best counsel to be obtained in the state, when looking up new seedlings. With this new departure in view, last September, I invited our worthy President, J. S. Harris, to accompany me to the township of Haverhill to see some seedlings that had been highly recommended on the farm of Peter Brook, but the President after examining them closely for a sufficient length of time, failed to *enthuse* worth a cent, and so we returned home sadder, and probably not much wiser, on the apple question. But if not out of order here I will simply state that on our way home we passed a most successful seedling hedge of Buck Thorn, *Rhamnus Catharticus*, on the fine farm of A. Welch.

November 17th, on invitation, Mr. Wm. McHenry, of St. Charles, accompanied me to examine the seedlings of Robert Waldron, of Cascade, Olmsted County. He knows a good apple when he sees one every time. Am sorry to say Mr. Waldron was confined to his bed at the time, but he had the kindness to order up a fine dish of his new seedlings from the Fameuse, and we, as well as all who saw them at the Fair at Rochester, last September, pronounced them beautiful to look upon, and choice in quality; as to hardiness, I think they differ but little from the Fameuse, *possibly* they may be a little more hardy. Mr. Waldron also has, to make a rough estimate, some two miles of promising young hedge of the Buck Thorn Seedlings, lining the roads and lane to his pasture. Last month I examined a promising new seedling on the farm of Mr. Hart, of Dover Townshp. Mr. Hart was absent, and we failed to learn much about it, except that the tree was hardy. We did not see the fruit; we learned that it bore this last season, but the fruit was all stolen. Said to be green in color, season late fall.

Richard Porter was next invited to counsel with me on the Forster seedlings. He has handled more trees than most men of our county, and knows whereof he speaks. Mr. Wm. Forster resides in the township of Orion, Olmsted County, some 18 miles from our place. He is a pleasant gentleman, like all Minnesota fruit growers, and

his wife and family are worthy of such a man. We had a very pleasant visit; was sorry to learn that Mr. Forster was too much out of health to attend this session. The wood of the Forster's Red Winter looks well; we have a specimen of this on exhibition and also of the Forsters Sweet. The fruit of the latter I suppose you have on exhibition, the other varieties did not bear much this season, and we did not see any of them.

Respectfully submitted,

Rochester, Jan. 15, 1884.

A. W. SIAS.

*NOTES ON THE FLORA OF WESTERN DAKOTA
AND EASTERN MONTANA ADJACENT TO
THE NORTHERN PACIFIC RAILROAD.**

BY JOHN B. LEIBERG.

[Read before the Minnesota Academy of Natural Sciences, March 4th, 1884, and published by permission of the Academy.]

While in the service of the Northern Pacific railroad company during the past year in the interest of tree culture, I had abundant opportunity to examine the interesting and to some extent peculiar flora of Western Dakota, and to a limited degree the eastern portion also, and the eastern part of Montana as far west as the Yellowstone river at Glendive, and to make large and full collections of the same. Copious and interesting notes were made respecting the botanical features of the region, and a few of the more prominent are presented for the consideration of the Academy.

The climate of eastern Dakota, in both rain-fall and temperature, does not appear to present any great variation from that of the prairie region of western Minnesota, except perhaps a somewhat longer winter. The climate of the western portion is very differ-

* NOTE BY THE SECRETARY. It seems very desirable to gather full and accurate knowledge of the flora of the prairies and plains of this country, and eventually to compare these with the similar region in Russia where fruit culture is very successful, with a view to the selection of such varieties of fruit trees, and forest and ornamental trees and shrubs, for importation, as shall be adapted to the climate and soil of the Northwest. Much may be added to the stock of information of this kind, if those having opportunities for observation will communicate to the Secretary botanical and climatological notes, as in the following essay.

ent. The summer is very dry; showers are of rare occurrence; and the temperature varies excessively. Thus in the month of July the mercury rose to 115° Fahrenheit, and fell to 32°. Such great variations cannot fail to modify plant life to a very great extent. The hot, scorching winds that generally accompany the high temperatures quickly dry up all vegetation, except along the water-courses. The extreme dryness of these hot winds is remarkable. During the great heat which prevailed in the early part of July, I saw the grass on the prairie, which was green and fresh as prairie grass usually is, completely dried up and converted into hay within a period of two hours. As a consequence of this dry weather, we find no annuals in summer. They only appear during the spring, while the ground is still moist. The perennials all have long root-stocks, which penetrate deeply into the ground and enable them to withstand the drouth effectually.

The surface of the country west of the Red river valley is more rolling than in Minnesota, and is found still more so as the Missouri river is approached. Numerous stony knolls and long ranges of rocky, pointed hills mark the ancient glacial moraines. The flora here shows plain indications of the proximity of the dry, treeless plains west of the Missouri; though at the same time the climate is humid enough to permit species of plants to grow and flourish, whose principal habitat is much farther eastward. Here and there alkaline pools appear with their peculiar plants, adding largely to the variety of the flora of this region. Many species are found whose home in the Southwest is at a high elevation, proving that as we go north the increase in latitude compensates for a decrease in elevation.

Scattered over the drift hills in great abundance, and the first flower to appear in spring is *Anemone patens*, L., var. *Nuttalliana*, Gray, attaining a luxuriance of growth never met with in Minnesota. After crossing the Missouri and the western boundary of the glacial drift, this plant wholly disappears. In the moist places of the prairies is found *Ranunculus glaberrimus*, Hook., and around alkaline ponds *R. Cymbalaria*, Pursh, the latter being very abundant west of the Missouri river. Another representative of this genus resembles *R. rhomboideus*, Goldie, but differs from that in its more erect and taller growth and much smaller flowers. It appears to be some undescribed species.

A *Draba*, probably *D. nemorosa*, L., is quite plentiful. Early in the spring, and flowering until late in the summer, we find *Vesicaria Ludoviciana*, DC. *Erysimum asperum*, DC., var. *Arkansanum*,

Nutt., is abundant as we proceed westward, becoming a very conspicuous plant. Around the alkaline ponds grows a *Nasturtium*, near *N. sinuatum*, Nutt. It may prove to be only a variety of this species.

Cleome integrifolia, Torr. & Gr., which is found here and there in Minnesota as an introduced plant, is first met with in its indigenous state in Pyramid Park near the Little Missouri river. There also, and nowhere else in the territory under consideration, *Cleome lutea*, Hook., was observed. *Polanisia graveolens*, Raf., was frequently noticed along the water-courses, differing somewhat from its character in Minnesota, in having a more clammy pubescence and longer and more turgid pods.

Viola Nuttallii, Pursh, was met with abundantly, but does not extend to any great distance west of the Missouri river, and was not observed east of Jamestown. *Viola cucullata*, Ait., was not rare in the region covered by the drift, but was confined to the borders of the numerous small ponds.

A *Cerastium* and two species of *Arenaria*, not determined, were very common. One of the *Arenarias* was met with only on the top of the buttes west of the Missouri, forming dense tufts, the short stems closely covered with small rigid leaves giving it a spiny appearance.

A rather common and showy plant was *Malvastrum coccineum*, Gray, the only one of the *Malvaceæ* seen.

Two species of *Linum*, *L. rigidum*, Pursh, and *L. perenne*, L., were found. The latter grows very rank, with showy blue flowers, often more than an inch in diameter. The seed-vessels were observed later in the season, and were found to be nearly as large as in the cultivated flax (*L. usitatissimum*, L.), with seeds about half as large, of a shining dark brown color, and apparently containing a considerable proportion of oil. The question arises, whether this wild flax could be improved by cultivation so as to equal in fiber, if not in oil, the *L. usitatissimum*. It is well worth experiment to determine these points, more especially as it is a perennial, while the cultivated flax is an annual.

Polygala verticillata, L., and another species of which no published description could be found, were frequently collected west of the Missouri, extending into Montana.

As might be expected, the *Leguminosæ* were well represented, but a lack of authorities and published descriptions prevented full and complete determinations of the many interesting species collected. Fourteen species of *Astragalus* were observed, among them

A. simplicifolius, Gray, and *A. triflorus*, Gray. The former was observed only in Montana, on the hills between McClennan and Hodges stations on the Northern Pacific railroad. *Psoralea argophylla*, Pursh, *P. esculenta*, Pursh, and *P. lanceolata*, Pursh, were noted. The latter possesses the peculiarity of forming at maturity a perfect joint on the stem near the ground. A light wind will then cause the plant to break off and go rolling along in the same manner as happens with *Amarantus albus*, L. (commonly called "tumble-weed") on the prairies of Minnesota. *Psoralea argophylla* and *esculenta* also break off near the ground, but do not appear to form a distinct joint. The separation in these species is effected by means of a constriction on the stem, which cuts off, as it were, the nourishment from the root, and causes the stalk to shrivel at that point, when the least touch or gust of wind releases the plant. On the hills near Mandan, and in no other place along the route, *Petalostemon macrostachyus*, Torr., was collected. Here also *P. villosus*, Nutt., was quite abundant. *Amorpha fruticosa*, L., and *A. canescens*, Nutt., were both well represented, but a little farther westward they were largely replaced by *A. microphylla*, Pursh. *Oxytropis*, *Desmodium*, *Vicia*, *Lathyrus* and *Hosackia* were found in abundance throughout the territory. *Lupinus perennis*, L., was met with in the valley of the Green river; also an apparently undescribed species of this genus was collected.

Eleven species of *Potentilla* were collected, among them *P. Pennsylvanica*, L., and *P. fruticosa*, L., the latter nowhere except in Pyramid Park. Only one species of *Prunus* was seen west of the Missouri river, namely, *P. pumila*, L. Growing abundantly on the rocky buttes was *Chamaerhodos erecta*, Bunge. So far as I know, this plant has not before been referred to this region. Our most common species of strawberry (*Fragaria Virginiana*, Duchesne) abounds east of the Missouri, but is very infrequent farther west. The hot dry weather prevailing during June and July doubtless proves unsuitable for its growth.

A gooseberry (*Ribes*) near *R. Cynosbati*, L., of a low bushy form, thickly armed with long stout prickles, grows on the summit of the dry baked clay hills of western Dakota and eastern Montana. Although growing in these extremely dry localities, it was heavily loaded in the month of July with large ripe juicy fruit, possessing a sweet and agreeable taste. Aside from scattered patches of *Shepherdia*, this was the only native edible wild fruit that was observed along the route after crossing the Missouri.

Hippuris vulgaris, L., rare in Minnesota, is plentiful in every little stream west of the Missouri, provided it is not alkaline and contains water sufficient to prevent complete evaporation during the dry season.

Of the *Onagraceæ*, *Epilobium palustre*, L., and *E. molle*, Torr., were sparingly found; more common were *Enothera caespitosa*, Nutt., and *E. albicaulis*, Nutt., the latter extending as far as to Muskoda station east of the Red river. Much more rare was *E. Missouriensis*, Sims. *Gaura coccinea*, Nutt., was very abundant.

Three species of *Cactaceæ*, *Mamillaria vivipara*, Haw., *Opuntia Missouriensis*, DC., and *O. Rafinesquii*, Engelm., were plentiful. *O. Missouriensis* was first observed, in going westward, on the hills around Mandan.

The *Umbelliferae* were mostly represented by species of *Peucedanum*, *Cymopterus* and *Musenium*. Of these only one, *Peucedanum nudicaule*, Nutt., extends as far east as Minnesota.

The *Compositæ*, as might be expected, were numerously represented. Species of *Liatris*, *Solidago* and *Bigelovia* were abundant. Asters were rather rare. *Helianthus lenticularis*, Dougl., (more correctly known as *H. annuus*, L., since it has been shown to be the original of the common cultivated sunflower,) was the only species of this extensive genus occurring at all plentifully west of the Missouri. *Lepachys pinnata*, Torr. & Gr., was wholly replaced by *L. columnaris*, Torr. & Gr., and its variety *Tagetes*, Gray. It is curious to notice the gradual transition to *L. pinnata*, as the Red river valley is approached. A number of species of *Artemisia* were noticed; among others *A. tridentata*, Nutt. (sage-brush), but not extending eastward much beyond Pyramid Park. *Senecio lugens*, Rich., var. *Hookeri*, Eaton, was common everywhere. Species of *Hieracium* peculiar to the far west were found; also *Grindelia squarrosa*, Dunal., which extends east into the edge of Minnesota. *Troximon cuspidatum*, Pursh, common in Minnesota, was replaced by *T. glaucum*, Nutt.; and *Iva xanthiifolia*, Nutt., by *I. axillaris*, Pursh. Two species of *Gaillardia*, *G. aristata*, Pursh, and an undetermined one, were collected. *Antennaria* was represented by *A. dioica*, Gærtn., a rather pretty little plant.

Aphyllon fasciculatum, Gray, of the order *Orobanchaceæ*, was very common on the dry hill-sides, parasitic on the roots of various species of *Artemisia*.

Numerous species of *Pentstemon* and *Castilleja* made up the bulk of the *Scrophulariaceæ*.

Only one of the order *Labiata* was collected west of the Missouri; this was a species of *Hedeoma*.

Three species of *Echinosperrum*, one *Mertensia*, and three species of *Eritrichium*, were noted as representing the *Borraginaceae*.

Phlox caespitosa, Nutt., is first found in going westward near the Missouri river, but only on the summit of the highest and stoniest hills; farther west it covers the ground nearly everywhere.

Asclepias Cornuti, Decaisne, was supplanted by *A. speciosa*, Torr., a closely allied species, rather more handsome though not so tall and robust.

Among the rarer *Chenopodiaceae*, I collected *Monolepis chenopodioides*, Moq., *Eurotia lanata*, Moq., *Sarcobatus vermiculatus*, Torr. (this only in Pyramid Park), *Salicornia herbacea*, L., and three or four species of *Obione*.

Among the *Polygonaceae*, *Rumex venosus*, Pursh, and several species of *Eriogonum* were of frequent occurrence.

Shepherdia argentea, Nutt., and *S. Canadensis*, Nutt., commonly called "buffalo-berries," and *Eleagnus argentea*, Pursh, the silver-berry, abounded along the streams.

A low trailing *Juniperus* was exceedingly common west of the Missouri, growing everywhere upon the sides of the dry rocky buttes.

Allium reticulatum, Fraser, two species of *Zygadenus*, *Smilacina stellata*, Desf., and *Calochortus Gunnisoni*, Watson, this last not extending east of Pyramid Park, and *Yucca angustifolia*, Pursh, make up the list of *Liliaceae* noted in western Dakota.

Scirpus maritimus, L., was common around alkaline ponds, together with several undetermined species of *Eleocharis*. Numerous *Carices* were observed, mostly differing from Minnesota species.

The *Gramineae* were much more sparingly represented than one would suppose to be the case. West of the Missouri fully half of the grass consisted of a single species, *Kæleria cristata*, Pers. The remaining half was divided between a dozen other species, such as *Aristida purpurea*, Nutt., an undetermined *Calamagrostis* near *C. stricta*, Trin., *Stipa Mongolica*, Turcz., and *S. viridula*, Trin., *Spartina gracilis*, Trin., *Brizopyrum spicatum*, Hook., *Bouteloua hirsuta*, Lagasca, and *B. oligostachya*, Torr., which two last commonly pass by the name of "buffalo grass," *Munroa squarrosa*, Torr., and *Buchloe dactyloides*, Engelm., the true buffalo grass, the last only occurring in scattered patches here and there. Several species of *Poa*, *Beckmannia erucaeformis*, Host., *Schedonnardus*

Texanus, Steud., *Eriocoma cuspidata*, Nutt., and several species of *Triticum*, complete the list of grasses collected.

Only two species of ferns were observed, a *Woodsia* and *Pellaea atropurpurea*, Link., the latter growing in the crevices of the rocky ledges on the summit of the buttes. A few mosses were seen, and two species of lichens.

The arboreal vegetation was, as might be supposed, very scanty. Aside from the timber on the Missouri river bottoms, only a few stunted willows, cottonwood, box-elder and Juneberry were found scattered at intervals along the streams.

A curious feature of the country west of the Missouri, beyond the limit of the drift, was the great number of fossil tree stumps, protruding through the sod. Hundreds could be counted in many places, and in some localities, especially in Pyramid Park, the fossil trunks were found where they had fallen, almost whole and but little the worse for the ravages of time. There is no doubt that during the Cretaceous and Tertiary periods extensive forests flourished in this region; and to judge from the size of the stumps remaining, some of the trees must have been of immense size. Many stumps were seen ten feet or more in diameter, and I heard of others still larger.

This region will yet prove a mine of wealth to the botanist studying our fossil flora. Fossil leaves in great abundance occur everywhere in the Tertiary sandstones and soft Cretaceous clays. In some places the clay beds were originally underlain by seams of lignite, which have been burned, baking the clay above into a kind of brown, red, or yellow brick, which shows perfectly the forms and venation of these fossil leaves. The region is well worth the time and attention of working botanists, both in recent and fossil botany; and will doubtless ere long receive its 'due share of exploration and study, since it has become so easy of access.

CATALOGUE.
OF
APPLE TREES IMPORTED IN 1870
FROM
ST. PETERSBURG, RUSSIA.
BY THE
U. S. DEPARTMENT OF AGRICULTURE,

Cions of which have been distributed under the following numbers:

NO.	RUSSIAN NAMES.	TRANSLATION.
A 1	Astrachaner, Rother.....	Red Astrachan.
" 2	Weisser Calville, Sommer.....	White Summer Calville.
" 15	Sussapfel von Toenarius.....	Von Toenarius Sweet apple.
" 44	Astrachaner, Weisser.	White Astrachan.
" 54	Luikenapfel	Luiken apple.
" 60	Anasapfel, Rother	Red Duck apple.
" 61	Edler Rosentreifling	Noble Redstreak.
" 68	Champagner, Fruher.....	Early Champagne.
" 69	Sommer Birnapfel	Summer Pear apple.
" 70	Winter Birnapfel ...	Winter Pear apple.
" 105	Grafensteiner, Russischer.....	Russian Gravenstein.
" 122	Borsdorfer Revaler	Borsdorf Revel apple.
" 123	Schafnase	Sheepnose apple.
" 153	Skvoasnoi Nalin.....	Transparent Juicy apple.
" 157	Belui Nalin	Juicy White.
" 159	Limonoe	Lemon apple.
" 161	Langerfeldskoe.....	Longfield's apple.
" 162	Buschbon ...	Buschbon.
" 164	Polosatoe Heidorns.....	Heidorn's Streaked.
" 166	Aport Letny.....	Summer O'Porto apple.
" 167	Scholtze Sladkoe	Yellow Sweet.
" 169	Slenka Sladkaya	Green Sweeting.
" 170	Revelskoe.....	The Revel apple.
" 171	Stekliannoe Z. Simowoe	Glass Winter apple.
" 173	Skerospelka Rannaja.....	Earliest Early.
" 174	Pipka, Malaja ...	Little Pipka.
" 176	Krasnabakoe	Red-sided apple,

NO.	RUSSIAN NAMES.	TRANSLATION.
A 177	Schlenka, Polosstaja	Green Streaked.
" 178	Barlowskoe	Barloff's apple.
" 180	Nejolskoe	Negoloff's apple.
" 181	Pipka Champanskaja	Champagne Pipka.
" 182	Kalville Kwasnuiletny	Calville Summer-red.
" 183	Burlowka	Burloff ka apple.
" 184	Arabskoe	Arabian apple.
" 185	Anisowka	Anisette.
" 186	Steklianka Reyels Kaja	Glass Revel apple.
" 187	Steklianka Selonka	Glass Green apple.
" 188	Arkad Scholti	Yellow Arcadian apple.
" 190	Tiesenhausenskoe	Tiesenhausen.
" 196	Polosatoe Sladkoe	Streaked Sweet.
" 197	Kriwospizoe	Curly Spiced apple.
" 198	Polu Miron	Crossed Barbel.
" 199	Naleiv Woskowoi	Waxen Juicy.
" 200	Repka Rosowaja	Rosy Little Turnip apple.
" 202	Saitschia Pipka	Hare Pipka.
" 203	Arkad	Arcade.
" 204	Rubez	Cut apple.
" 205	Kajabowka	Karaboff apple.
" 206	Zarski Schip	Czar's Thorn.
" 207	Stupka	Stoupka.
" 208	Korolewskoe	Royal.
" 210	Rubezuinogradni	Cut Wine apple.
" 212	Berkowskoe	Berkoff's apple.
" 213	Stepanouka	Stepanoff's apple.
" 214	Sadowskoe	Garden apple.
" 215	Kustoe	Bushy apple.
" 217	Sacharnoe	Sugar Sweet.
" 218	Fokinskoe	Fokin's apple.
" 219	Belaja Tebedka	White Swan.
" 220	Scholkowka	Silken apple.
" 225	Getmanski Bob	Getman's Bean.
" 226	Rubez Belui	White Cut.
" 228	Krimskoe Wochina	Vochin's Crimean apple.
" 230	Titouka	Titus apple.
" 231	Solotoi Arkad	Yellow Arcadian.
" 234	Muscatelnoe	Muscatel.
" 236	Antonouka	Anthony's apple.
" 240	Teschanka	Lieby apple.
" 242	Schriokolitschiko	Broadleaved.
" 245	Borouinka	Mushroom.
" 246	Plodowitka	Prolific.
" 247	Popouka Polosataja	Popoff's Streaked.
" 248	Beel	White.
" 252	Aport	O'Porto apple.
" 260	Simnoe Polosatoe	Winter Streaked.
" 261	Aport Reptschati	O'Porto Turnip Seedling.
" 262	Charlamoswkaoe	Charlamoff.
" 264	Duchowoe	Smelling apple.
" 265	Pipka Govkaja	Butter Pipka.
" 266	Polosatoe Nowgorodskoe	Novgorod Streaked.
" 267	Gruscheff ka	Pear apple.
" 268	Sakaritnoe	Saccharine.
" 269	Aport Rosowui	O'Porto Rosy.
" 272	Schapotschka	Little Hat apple.

NO.	RUSSIAN NAMES.	TRANSLATION.
A 273	Gruscheffka Bsennaja.....	Autumn Pear apple.
" 274	Rosowoe.....	Rosy.
" 275	Sototoreffka.....	Zolotoreff's apple.
" 276	Polu Stekianka.....	Half Glassy.
" 277	Wargul.....	Wargul.
" 278	Borowinka Krasnaja.....	Red Mushroom.
" 279	Aportowoge Simowoe.....	Winter O'Porto.
" 282	Renetto Woroneschski.....	Woronech's (name of a province.)
" 283	Slast.....	Apple Sweet.
" 284	Stekianka Kremer's.....	Kremer's Glassy.
" 285	Repristoe Walisonoe.....	Turnipy Juicy apple.
" 286	Kremerskoe.....	Kremer's, (seedling.)
" 287	Rigaer Skwosnoinalin.....	Riga Transparent Juicy.
" 288	Malinowskoe.....	Raspberry.
" 290	Ukrainskoe.....	Ukraine apple.
" 295	Imperial.....	Imperial.
" 304	Suislepper.....	Switzer.
" 310	Christapfel.....	Christmas apple.
" 313	Muscatapfel.....	Muscat, or Persian apple.
" 315	Herrenapfel.....	Lord's apple.
" 316	Rothe Reinette.....	Red Queen.
" 317	Golubinoe Beeloe.....	White Pigeon.
" 321	Pipka Sladkaja.....	Sweet Pipka.
" 322	Kovitschneoe.....	Brown apple.
" 323	Repouka.....	Turnip apple.
" 324	Neemezki Kallville.....	German Calville.
" 327	Scholti Arkad.....	Yellow Arcadian apple.
" 330	Polosatoe Naliwnoe.....	Juicy Streaked.
" 332	Plodowitka Ramaja.....	Early prolific.
" 333	Skwosnoi Krasnoi.....	Red Transparent.
" 334	Skwosnoi Schotoi.....	Yellow Transparent.
" 335	Skwosnoi Selennoe.....	Green Transparent.
" 336	Skwosnoi Beeloe.....	White Transparent.
" 337	Scrinka.....	Grayest.
" 338	Gruscheffka Revelskaja.....	Revel Pear apple.
" 339	Reinetti Beelui.....	White Queen.
" 340	Himbeerapfel Lievlander.....	Lowland Raspberry.
" 341	Borsdorfer.....	Borsdorf.
" 342	Scharlottenthaler Golba.....	Charlottenthaler (the name of a place) apple.
" 343	Weinapfel, Rother.....	Red Wine apple.
" 344	Sultanapfel.....	Sultan apple.
" 350	Lapouch.....	Burr apple.
" 351	Plodowitka Cuadkaja.....	Prolific Sweeting.
" 352	Swonkoe.....	Resonant apple.
" 354	Kriwospizoe Aromatnoe.....	Curly Spiced Aromatic.
" 355	Aport Herbst.....	Autumn Orange.
" 359	Motschetschnoe.....	Wetting apple. Literally, <i>apple to be preserved in water, (as done in Russia.)</i>
" 360	Funtowoe.....	Pound apple.
" 362	Swinzoffka.....	Lead apple.
" 364	Beel Wochins.....	White Wochins (a name) apple.
" 367	Polosatoe.....	Red Streak.
" 368	Mirone Sacharni.....	Sugar Barbel.
" 369	Pipka.....	Pipka.

NO.	RUSSIAN NAMES.	TRANSLATION.
A 370	Lebedka	Swan apple.
" 371	Skrut, Deutscher	Skrout, German.
" 372	Petrowskoe	St. Peter's.
" 374	Wislowchoe	Pendent Ear apple.
" 375	Koritschewoe Ananasnoe	Brown Pine Apple.
" 377	Limonnoe S. holtoe	Yellow Lemon.
" 378	Orsimui	Hibernial apple.
" 380	Gruscheffka Moskoloskaja	Moscow Pear Apple.
" 382	Buzkafa Selonka	Russian Green apple.
" 385	Bodewskoe	Bode's apple.
" 387	Dobruj Krestianin	Good Husbandman apple.
" 393	Zitsonnoe Zarskoe	Imperial Citron.
" 398	Krupneena	Enormous.
" 399	Krimskaja Selonka	Green Crimean.
" 402	Borsdorfer	Borsdorf.
" 403	Anis Sacharnui	Sweet Anisette.
" 406	Pipka Sacharnaja	Saccharine Pipka.
" 407	Tschernoe Drewo	Blackwood.
" 408	General Greig	General Greig.
" 409	S. Wochinskoe	Wochin's apple.
" 410	Repka Malenka	Little Seedling.
" 413	Skrischapfel	Cross apple.
" 424	Bergamottnoe	Bergamotte.
" 425	Anis Rospisni	Pointed Anisette.
" 426	Swmez	Apple "Lead."
" 427	Anisimowskoe	Anissim's apple.
" 429	Bosklonowka	Bosklonoff's apple.
" 430	Arkad Kruglui Woskowoi	Round Waxen Arcade.
" 433	Orlowskoe	Orloff.
" 437	Sachoiswan	Saxonian.
" 438	Rospisnoe	Pointed.
" 439	Krimskaja Beel	White Krim.
" 441	Grimuschka	Rattling apple.
" 442	Kalville Scholti	Yellow Calville.
" 444	Reinette Liubski	Lubsk (name of a place) Queen.
" 445	Romianka	Red-cheeked apple.
" 447	Ranette Kiluski	Queen of Kiew.
" 448	Kardinal	Cardinal.
" 450	Beel Krasawiza	Handsome White.
" 451	Warschtapel	Warsztappel.
" 453	Arkad Krasiwui	Beautiful Arcade.
" 455	Riabinouka	Berry apple.
" 457	Klinewskoe	Klineff's apple.
" 458	Scholtinahw	Yellow Juice.
" 461	Rebristoe	Strong-ribbed.
" 462	Rubez Slonniu	Green Cut.
" 463	Pipka Postillnaja	Spreading Pipka.
" 466	Repka Kislaja	Sour Turnip.
" 467	Miron Ploskui	Flattened Barbel.
" 468	Beel Rospisnaja	Pointed White.
" 469	Babuschkino	Grandmother's apple.
" 470	Lapouchoe	Burr apple.
" 471	Anisowaja Plodowitka	Prolific Anisette.
" 472	Ostrekowskaja Steklianika	Ostrekoff's Glass.
" 475	Postichouka	Holdfast.
" 476	Arkad, Rother	Red Arcade.
" 477	Roschdestwenskoe	Christ Birth apple.

NO.	RUSSIAN NAMES.	TRANSLATION.
A 478	Tonkowetka Polosataja.....	Thin Twig Streaked.
" 481	Mzenskoe.....	Mzedsk apple.
" 490	Glinzowoe.....	Clay apple.
" 502	Russische Rambour Reinette....	Russian Rambour Queen.
" 544	Lapouchoe Naliw.....	Juicy Burr apple.
" 548	Borowinka Lugouaja.....	Meadows Mushroom.
" 551	Arbusowskoe.....	Water-melon apple.
" 555	Krass Sladkaja.....	Red Sweeting.
" 557	Revelskaja Polosatoe.....	Streaked Revel.
" 558	Konitschenewoe Rannoe.....	Early Cinnamon.
" 563	Krimskoo Naliwnoe.....	Juicy Krimtarter.
" 565	Wergunoks.....	Worgunok.
" 566	Krupnui Skworminaliw.....	Large Sub-acid.
" 568	Melonenapfel.....	Melon apple.
" 569	Rosenbager.....	Slender Rose.
" 575	Alabaster, Weisser.....	Alabaster White.
" 578	Boredorfer Leipziger.....	Leipzig Borsdorf.
" 579	—— Tierlandischer Sommer...	Summer Lowland.
" 580	—— Tierlandischer Winter...	Winter Lowland.
" 584	Erdbeerapfel.....	Red Calvill.
" 585	Zusows Winterapfel.....	Zusoff's Winter apple.
" 587	Englischer Pepping.....	English Pippin.
" 592	Arkad Dilmui.....	Long Arcade.
" 595	Mzenskoe Sladkoe.....	Mzensk Sweet.
" 597	Pesolschnaja Steklianika.....	Glassy Sand apple.
" 599	Romenskoe.....	Omensk, (name of a place.)
" 600	Dlimoe.....	Long Apple.
" 864	Arkad Duimtschataja.....	Smoky Arcade.
" 874	Borowinka Sladkaja.....	Sweet Mushroom.
" 962	Reinette Muscateller.....	Queen Muscatel.
" 963	Muscateller Tievlander.....	Lowland Muscatel.
" 964	Herbst Streifling.....	Autumn Streaked.
" 965	Gruscheffka Sladkaja.....	Sweet Pear apple.
" 966	Tuchernokrasnoe.....	Bed-black.
" 967	Selonnoe.....	Greening.
" 968	Saburonskoe.....	Aloe apple.
" 969	Zantarnoe.....	Zantar apple.
" 970	Tuhuginka Selomaja.....	Green Citron.
" 971	Wassilli Welikui.....	Vasilis Largest.
" 972	Trechtrshromnoc.....	Overflowing.
" 973	Stekliannoe Duschisstoe.....	Shining Aromatic.
" 974	Rasumowski Noschok.....	Razumoffsky's Downy.
" 975	Tenekrasnoe.....	Red Teat.
" 976	Tipka.....	Linden apple.
" 977	Tuhutiltchnoe.....	Aromatic.
" 978	Beel Solotofskaja.....	Golden White.
" 979	Beel Krupnaja Prodolgonataja...	Large Long White.
" 980	Beel Plikano Uskaja.....	Plikanoff Small.
" 981	Beelowoe Scholto Seroe.....	White Russett.
" 982	Skrut Beelowoi.....	Round White.
" 983	Astrachanskoe Skwasnoe.....	Red Astrachan.
" 984	Anis Kurski.....	Koursk's (a name of a place) Anisette.
" 985	Anis Krasnui.....	Red Anisette.
" 986	Anis Selanui.....	Green Anisette.
" 987	Anis Schaltui.....	Yellow Anisette.
" 988	Ananasnoe.....	Pine apple.

[From an unfinished article kindly sent in advance by the author, from the Report of the Montreal Horticultural Society.]

REPORT ON THE RUSSIAN APPLES

IMPORTED BY THE U. S. DEPARTMENT OF AGRICULTURE IN 1870.

BY CHARLES GIBB, ABBOTTSFORD, QUEBEC.

It is important to know which are the really good apples in this collection of 252 varieties. This collection of apples was received by the Department from Dr. Edward Regel, the director of the Imperial Botanic Gardens at St. Petersburg. A small proportion only of them had been grown in that fickle climate. They were, therefore, very largely "obtained" by Dr. Regel from different sources, and these mostly, though not wholly, from the coast Provinces of Russia.

There have been many drawbacks to the introduction of the Russian apple. Nomenclature in Russia is much confused, that of the Department list no less so. We have duplicates under different names, confusion of names as to types and families, evident mistakes. In Dr. Regel's work on Russian Pomology the lists of synonyms show how confused is nomenclature in Russia. Aport, which is of Kaiser Alexander family, is noted as a synonym of Antonovka, Titovka of Aport, Red Calville of Titovka, Titovka of Stklianka, Anisovka of Borovinka. If Spitzenburg and Northern Spy were synonyms of Golden Russet, the case would be somewhat parallel.

Unfortunately in the Department list, the name is, too often, no guarantee to the nature of the fruit.

Of the two apples named Red Astrachan, No. 1 is said to be Duchess, or something very like it, the other, No. 983 is a mistranslation, and not intended for it. Apples whose names state them to be of Greening, Anis or Blue Pearmain type, prove to be Duchess; Aports do not prove to be of Alexander family; Stekliankas the very opposite of Greenings. Apples marked Beel or Belui are far from white, and others noted as red, show no trace of it. Those marked winter, if from the northern part of the coast provinces, where the summer is short and cool, are by no means winter apples in our longer and warmer summers.

The early ripening of these apples on the Department grounds at Washington gave many the idea that they were all summer apples, that is summer irrespective of the climate they are grown in. Prof. Budd, of Ames, Iowa, in 1876 on August 20th, noted Borsdorf, No. 341, on the Department grounds, as "falling from the tree and about ready for use," while he quotes an authority from Northern Vermont saying, "a long keeping apple of finest quality." Again, Red Queen, No. 316, Mr. Budd notes as "a rusty green apple about mature the 20th of August, and falling from the tree." Mr. A. G. Tuttle, Baraboo, Wis.,

says: "Fruit of good size, red on the sunny side, season January to April." It may thus be seen that the Department test was no test at all as regards the quality and keeping of these fruits, nor were they so intended by the Department, their grounds having been used merely for the purpose of growing for distribution. These trees, as received by the Department, were labelled by number; they were also sent out by number. Some mistakes are observable, and mistakes will happen when things are received and sent out by number. These numbers referred to a list in Russian which was translated at the Russian Embassy in Washington and distributed by the Department. Unfortunately the Russian names are rendered into English sounds from a Russian not an English standpoint. These names should be rendered *euphonically* from an English point of view. Thus "ow" and "ou" are intended to be pronounced "ov" or "off," "ja" should be pronounced "ya." This has taken from the Russian all of its music. We should have uniformity in the spelling of the Russian names. We find naliw, naliv, nalin, naleiv, nallwnoe and even walisonoe, for the word translated juicy or transparent. We find scholti, scholtor, schaltui, soltoi, scholtoe for the word yellow. The word green is spelt in six different ways, but this is in part the work of the printer. We have Rannet Kiluski, Queen of Kiew, or Kiev, as we would say, but who would suppose Kiluski had anything to do with Kiev; any number of such mistakes.

The translation also is badly done.

The translation of the foreign names is unfortunate; sometimes merely unmusical, sometimes wrong. In 399 Krimskaja is rightly translated Crimean. In 439, Krim, and in 563, Krimtarter. In 200 and in 466 Repka is translated turnip, whereas in 410, it is translated seedling, which must be much nearer the truth, for apples of fine quality in Russia are known as Repka. The translation of the German names is still more open to criticism. In 355, Aport is translated orange, which it does not mean. No. 534, Erdbeerapfel (or strawberry) is translated Red Calville. No. 162, Buschbon is translated Buschbon. It probably is intended for Buschbohn dwarf bean. Sinisleper is translated into the English (?) word Switzer. The translation was done at the Russian embassy at Washington, but unfortunately the Russian who dictated it was not an apple grower, and did not know that he was disintegrating the foundation stones of Russian nomenclature in this country.

There is another drawback. In the North scions have been usually top-grafted on crabs. Growers in Vermont, Wisconsin and Minnesota are now agreed that the crab stock is uncongenial to the Russian apple. The experience of Mr. Tuttle will illustrate this. Of 127 Tetofsky, top-grafted on Transcendant, after ten years growth, but one living; on yellow crab, 2 trees alive out of 74, the Tetofsky having made a growth, before dying, of six to eight feet; of 57 on apple, all alive and doing well. Mr. Sias, of Rochester, Minnesota, and Mr. Webster, of South Northfield, Vt., often speak of fruit, medium in size, top-worked on crab, larger on apple. It is to be regretted that our first impressions of the Russian apple were either from specimens grown in the climate of Washington, or else from top-grafts on crab at the north.

My information in the following list is based upon visits in August last to the orchards of Mr. Spaulding (formerly that of Mr. Moulton), near Minneapolis; A. W. Sias, Vice President Minnesota Horticultural Society, Rochester, Minn.; Underwood & Emery, Lake City, Minn.; A. G. Tuttle, Baraboo, Wisconsin;

State Agricultural College, Ames, Iowa; Elwanger & Barry, Rochester, N. Y. Also Mr. A. Webster, of South Northfield, Vt. and Dr. Hoskins of Newport, Vt., brought to the Montreal Horticultural Society Exhibition, samples of their Russian fruits, and gave me every opportunity of getting information from them. Oliver Gibbs, Jr., of Lake City, Minn., also furnished me descriptions of a few varieties found by him after my visit to that State.

Also in notes and drawings from Mr. Wm. Saunders, of the Department of Agriculture, but as the Washington climate is not the climate these fruits were intended for, I shall seldom quote from them.

Dr. Regel published his *Ruskaya Pomologaya* in 1863*. The trees received from him by the Department, arrived, I believe, in the winter of 1870. At that time Dr. Regel was making a vigorous effort to test, in the climate of St. Petersburg, all the varieties of fruit likely to prove hardy there. The fruits of the Province of St. Petersburg are carefully described. He also collected samples from Riga (from Messrs Wagner, Evegginger and Detrich) Novgorod, Dorpat, Pskov, Valaam, also from Iver, Moscow, Tchernigov, Tula, Veronesh, Penza, Kazan, Astrachan and other places. These samples he describes, sometimes noting local opinions as to their value, and sometimes merely noting the characteristics of the fruit as examined by him.

This book is full of facts of interest to us. Dr. Regel assumes nothing. His work is grand, good, foundational work; but it was not followed up as it should have been, by a national convention of fruit growers, and by a national exhibition of fruits. The fickle climate of St. Petersburg, proving a severe test for many of the varieties he had gathered for trial in his nurseries, he ceased to experiment so largely; selected a smaller list of those best suited to the needs of his own climate; and henceforth Dr. Regel gave but little thought to apples, but devoted his vigorous energies to gathering from Central Asia those numberless Botanic rarities which have rendered the Imperial Gardens of St. Petersburg of such interest to men of the North.

1. Astrachaner Rother;—Red Astrachan;—If not Duchess, so like it as to be hardly distinguishable from it;—Spaulding.

60. Anasapfel Rother;—Red Duck;—Of the Yellow Transparent family. A large, oblong, conic, greenish yellow apple much like Yellow Transparent, skin rougher than Yellow Transparent and not as yellow, says Mr. Tuttle. Mr. Webster finds it a little better in quality than Charlottenthaler, but smaller in size and therefore not equal for market. At Mr. Underwood's it agreed exactly with Mr. Tuttle's description.

68. Champagne Fruher;—Early Champagne;—A small early conic apple, colored like a Duchess; a sharp acid with slight flavor. I saw this both at Mr. Tuttle's and Mr. Spaulding's, but am not sure if the same fruit or not.

Mr. Sias says, this is the earliest apple we know, an early and abundant bearer, rather tart, but an excellent pie apple. It is striped with red, beautiful in shape, and very hardy; Mr. Sias has had it bear the same season he grafted it on the Palmer Sweet Crab. It makes a good union on that stock. Mr. Saunders speaks of it on the Department grounds as a promising early fruit, small in size, but very pretty, and would make a fine cooking apple. Ripe enough to test on 24th of June.

*Paragraphs in finer type are quotations from or the descriptions as given in Dr. Regel's book.—SECRETARY.

69. Summer Birnapfel;—Summer Pear;—A white apple, rather small, very conic, with wrinkled basin.—Sias. It seems not the same as Pear apple No. 267.

153. Skvoasnoi Nalin; Transparent Juicy—Dr. Regel describes this as one of the most popular kind of apples. It is grown in the North part of the Province of St. Petersburg, and in Provinces to the the South of Mosoow. This and the White Na'iv constitute the larger part of the apples to be seen in the Province of St. Petersburg. This true Russian apple, on account of its good quality, heavy bearing, transparency and beauty, has become widely popular.

Transparent (nalivnoe) app'es are beautiful dessert fruits. They sell at high prices, ripen in September, and must be used at once. When the fruit is opaque it may be kept till December.

157. Belui Nalin; Juicy White—A white fruit of good size; acid, but milder when fully ripe, says Mr. Tuttle.

Dr. Regel say's the Belui Naliv is one of the most valuable of Russian apples, because it grows even in the Northern part of the province of St. Petersburg and at the Valaam Monastery near the Northern end of Lake Ladoga, and in some parts of Finland. It takes first place before all others, just as does Skvosnoi Naliv, which is about as popular. It stands our severest winters at St. Petersburg, and bears every year or at any rate every second year, heavily. It grows without any care, grows in neglected gardens, and is the earliest green apple in our markets.

Ordinary samples are a little below medium in size; good specimens a good deal above it, and quite yellow when ripe. Season, August till December, but if not preserved very carefully it will rot in September and October. Dr. Regel notes as synonyms of this apple, the White Astrachan, of Lucas and Oberdick and the P'ossart's Moskauer Na'ivia of Lucas and Oberdick. This apple, however, is not at all of white Astrachan type.

The Belui Skvosnoi Na'iv, Dr. Regel describes from samples received from Nishny Novgorod, and the provinces of Moscow and Vladimir, and the South. He says he thinks it is often mixed with Naliv Belui.

161. Langerfeldskoe.—Longfield.—An early winter fruit of fine quality, and bright attractive color. As pointed out by Mr. Webster, it is the same as No. 587, English Pippin. Mr. Budd was told at the nursery of Mr. C. H. Wagner, at Riga, that this apple was a seedling grown by an Englishman on the Volga, and that it was sometimes known as the English Pippin, and sometimes Longfield, supposed to be from the shape of the field the tree was growing in. Mr. Budd received it both from Moscow and St. Petersburg, and he has that of the Department list I believe under both numbers. His are all alike and true to name. It therefore seems to be one of those apples which is apt to come true to name from different sources. Mr. Tuttle, says it is as good a bearer as Duchess, and thinks the finding of this worth all the trouble and expense he has had of testing so many Russian varieties. The flesh is white and fine grained; the skin bright yellow and bright pink. Mr. Tuttle says it would be safe to plant 1,000 trees of it. Its fault is its small size; a fault increased by top-grafting on crab, but those who are growing it on apple roots in rich prairie soils in the West, do not seem to grumble at its smallness in size.

Dr. Regel says the Langerfeldskoe as far as we know has been grown only in the garden of Mr. Longfelder, at the German colony of Sarepta, on the Volga, half way between Saratov and Astrachan. It is a lemon colored apple, red on the sunny side with white tender, juicy flesh. Neither the cold nor the winds nor the storms of the intensely steppe country of Sarepta disturb the growth of this tree. Of 100 different varieties growing in the garden of Mr. Longfelder, only this one bears fruit every year. Let us remember that Sarepta is not a high northern climate.

162. Buschbon;—Buschbon;—Mr. Saunders, of the Department of Agriculture, at Washington, says, a very good summer fruit, somewhat aromatic in flavor, ripe about June 22nd.

164. Polosatœ Heidorns;—Heidorn's Streaked;—A very beautiful, large sized, striped apple, sweet and of delicate texture, but short in season. Such were the specimens brought to the Montreal Horticultural Society Exhibition. Mr. Webster finds the fruit large and fine even when grafted on crab. The tree, Mr. Webster says, is of slow growth and a moderate bearer.

166. Aport Letny;—Summer O'Porto;—A large, flattened, angular, brown cheeked apple, of fair quality.—September. It is not of Aport or Alexander likeness, says Mr. Webster.

Dr. Regel speaks of this as a fruit samples of which he received from the province of Moscow, and Tchernigov, and seems to have been named by Mr. Atriganiev. It is at first a greenish yellow, and becomes, later, a beautiful yellow, like wax with dots. The flesh is tender, juicy, agreeable and mildly acid. A nice early table apple from September to December. It is different from the Skvosnoi Nalio, being larger in size and more yellow in color. It endures well their cold winters. The colored picture in Dr. Regel's book is a somewhat ribbed apple, a good deal like Charlottenthaler.

167. Scholtœ Sladkœ;—Yellow Sweet;—Mr. Tuttle says fruit medium to large, earlier than Yellow Transparent.

178. Barlowskœ;—Barloff;—An apple of distinct family features, as I saw it in Mr. Tuttle's orchard showing near relationship in its size, form and color. It is a sweet apple of fair quality, ripe at the beginning of September. Perhaps it may be the Sweet Aport that I saw in Orel in Russia. That grown by Mr. Webster however is a flat sub-acid thin flavored fruit and in shape more like Zolotoreff and Turnipy Juicy and of no special merit.

180. Nejolowskœ; Negaloff;—An October fruit of good size and fair quality, but not of special value. Tree of Duchess growth, says Mr. Webster.

182. Kalville Kwasnoilet;—Red Summer Calville;—Dr. Regel states that there are many of these Calvilles, German, Polish and Russian, but this is the variety which has been grown in the province of St. Petersburg, and specimens of it appear in the collection sent from Moscow and the south provinces. It is an apple about medium size, pretty well covered with red. The flesh is white, near the skin a little red, very tender, a highly agreeable vinous acid. It ripens the end of August and beginning of September and keeps till November or December. On dry soil the tree suffers in severe winters, and yet it is stated to be one of the best, if not the best, summer apple for the St. Petersburg climate.

The Krasnoi Simnoi Calville which I saw in the grounds of Ellwanger and Barry last summer was, as far as I can remember, very like the colored plate and description of Dr. Regel. Although in name Winter (Simnoi) it ripened in August.

Dr. Hoskins has also the Red Summer Calville which he received from James A. Nelson, Indian River, Mercer county, Pa., who speaks of it as a fine, early dessert apple and the only Russian he has found to be of any value.

184. Arabskœ;—Arabian;—There is some mistake here. Both Mr. Budd and Mr. Tuttle have fruited this apple, and it appears to be a Duchess or an apple very closely resembling it. The Arabskœ of Ellwanger and Barry is a large flattish fruit, of deep pink color, very beautiful, though only of fair quality and not a long keeper like the Arabskœ we saw at Volsk. This was received from Moscow, and yet hardly agrees with the description given to me by Mr. Shroeder, at Moscow, as a flat, conic hard, winter apple. However No. 316, Lord's apple, is a true Arabskœ.

Dr. Regel speaks of the Arabskœ as being grown at St. Petersburg and in the provinces to the south of Moscow. When on the tree the apple is green; afterwards a yellow green, and on the sunny side a peculiar shade of dark, dingy red, covering one third or half of the apple. The flesh is white, hard and sour, and when ripe, somewhat

tender and agreeably sour. The tree is hardy at St. Petersburg, only young trees being injured there. The tree is large and bears a medium amount of fruit, which ripens in October and keeps till spring or next fall. It is recommended as one of the best winter apples.

Dr. Regel also received samples from Astrachan and from another place. The wood cut given by Dr. Regel is from a specimen of St. Petersburg growth, and from its conic almost Gilliflower form, is quite unrecognizable as an Arabskoe. Dr. Regel's colored plate is from a specimen from Astrachan, and is more like those we saw in Russia. Dr. Regel believes these to be the same, only modified by climate.

The Arabskoe Polosatoe, known to Dr. Regel only from sample from Riazan, south-east of Moscow, is described as a yellowish, green, kitchen apple, with a dark carmine red side; a tasteful vinous acid. In season from November till the end of winter.

185. Anisowka;—Anisette;—Mr. Tuttle says this is Duchess.

The Anisovka seems to be the best variety of the Anis with which Dr. Regel is acquainted. It is grown in the provinces of St. Petersburg and Moscow, and southward from these points. It has even been grown at the convent of Valaam. Dr. Regel says, that the trees have stood the worst winters at St. Petersburg, and bear heavily every second year. It is very popular, and fetches high prices, as it is good, either for eating or cooking. It reaches its perfection at the end of September and may be kept till February or even March.

187. Steklianka Selonka; Glass Green;—Just like Duchess, say Mr. Spaulding and Mr. Tuttle, in tree and in fruit, but stated by both to be later in ripening. Mr. Tuttle also says, that the tree is a stronger grower. There is some mistake here as the Stekliankas or Greenings are of a different type.

188. Arkad Scholti; Yellow Arcadian;—No's. 231 and 327 in the catalogue bear the same name. The Arkads in Russia are early sweetish apples, of medium size, value 1 only for their earliness and the hardness of the tree. Mr. Sias has fruited No. 188 and speaks of it as one of the most successful varieties on the Hislop Crab, as far as the tree is concerned. Fruit nearly white and glossy, roundish, of full medium size, second rate in quality, a shy bearer. Some others who have fruited Yellow Acadian do not know under which number they obtained it. Mr. Saunders sends me a cut taken in the grounds, at Washington, of 231, which is over three and a half inches wide and three inches deep. Mr. Saunders says, it is an apple of good size, deep yellow, striped with red, flavor not high, but a good cooking fruit. We must not assume these yellow Arcadians to be all alike,—in fact we must assume nothing.

190. Tiesenhausenskoe; Tiesenhausen;—Mr. Tuttle says that this is in form and color like Ben Davis, of good quality, and the best keeper of all the Russians fruited with him. Tree a fine grower and very hardy.

Dr. Regel speaks of this as a fruit introduced by Baron Tiesenhausen into the province of St. Petersburg, whither it was sent for exhibition in 1860 and in 1866. Baron Tiesenhausen seems to have received it from Dorpat, but Dr. Regel queries whether it is known in the coast provinces, and names it after the gentleman who brought it into notice. It is a yellow apple with scarcely a tinge of red as grown in the north. Some specimens are oblong, conic; others, singularly, abruptly conic towards the cavity, as well as towards the basin. The flesh is white, tender, juicy, sub-acid, good for table and home use; ripe in September and keeps, says Baron Tiesenhausen, till March. The tree is small, but productive, and suffers only in the severest winters at St. Petersburg.

197. Kriwospizoe.—Curly Spiced.—An apple, somewhat of Alexander features. Mr. Tuttle says it has been condemned in the east, but it is an apple of pretty good quality, with some flavor; not bad, but we have too many of such apples.

198. Polu Miron;—Crossed Barbel;—Dr. Regel says this is grown about St. Petersburg and in the provinces to the south of Moscow. It is an apple from small to medium size; a yellowish green in color, with red on one side, in splashes and stripes. Farther

south it is more highly colored. The flesh is tender and sweet, with a kind of bitter after taste, which it loses when fully ripe. The tree is upright, bears plentifully and does not suffer during cold winters at St. Petersburg. It ripens in the beginning of September, and keeps some months later. Recommended for home use only.

202. *Saitschia Pipka*;—*Hare Pipka*;—Dr. Regel says this is grown about St. Petersburg, and it seems in the coast provinces also; an oblong, conic apple, of medium size, green or greenish yellow, with some red in splashes. Flesh is white, tender and juicy, and has an agreeable, vinous flavor. The tree grows to a large size and stands the climate of St. Petersburg well. A table apple that keeps till winter. According to Baron Tiesenhausen, not productive.

206. *Zarski Schip*.—*Czar's Thorn*.—Mr. Webster says, an extremely hardy tree, the scions and spurs having a peculiar, stiff, thorny appearance. Fruit, large, coarse, watery, bitter and worthless. I think there is some mistake here. Mr Tuttle describes it as a sweet apple. That of Ellwanger & Barry, and which was received from Moscow, they describe as a large oblong, sweet, apple, skin red and yellow. If sweet, and nearly all yellow, it is very like that which we saw on the upper Volga.

Dr. Regel speaks of this as a pale, yellow apple with light dots. Flesh, greenish white, tender, juicy and sweet. According to Krasnoglasov, and other apple dealers in Moscow, it often becomes transparent. Young trees suffer in severe winters at St. Petersburg. Dr. Regel thinks it is grown all through the south provinces, but in small quantities only. Dr. Regel describes two other apples under name of *Czar's Thorn*.

210. *Rubezuinogradni*.—*Cut Wine*.—Size and shape of *Maidens Blush*, a sharp, acid apple, with some flavor, October.—Webster.

This, says Dr. Regel, is grown in the province of St. Petersburg. It would seem from the cut in Dr. Regel's book, to be an apple about medium size. When upon the tree it is green; when ripe, yellowish green—sometimes with a nice, red cheek. The flesh is greenish white, tender and agreeable sub-acid. A good autumn table and cooking apple, said by some people to keep till February, but the samples Dr. Regel had rotted in October.

212. *Berkowskoe*.—*Berkoff*.—Fruit, much like *German Calville*, probably the same.—Tuttle. See 324.

214. *Sadowskoe*.—*Garden*.—A smooth green, crude, fall apple, sweetish or very mildly acid, fruit medium in size and quality. Tuttle.

219. *Belaja Tebedka*.—*White Swan*.—A large good-looking fruit, rather acid on June 28th, says Mr. Saunders.

220. *Scholkowka*.—*Silken Apple*.—A handsome fruit, nearly white, of fair size and good quality. Season September. Sias.

225. *Getmanski Bob*.—*Getman's Bean*.—Tree, says Mr. Webster, a slow grower, of peculiar, irregular, spreading habit, and a tardy bearer. Fruit large to very large, striped, magnificent, firm, crisp, and of most excellent flavor. Season, October. Mr. Tuttle says, it is one of the best trees, and speaks of the fine size and appearance of the fruit, and its probable market value. The fruit as I saw it at Mr. Tuttle's, showed the size, angularity, flatness, and conciseness of an *Anis*, of the striped or mottled type, but the fruit as I saw it this year was below par.

228. *Krimskoe Wochina*; *Vochin's Crimean*.—Dr. Regel describes this only from samples grown by Mr. Vochins from Pskov. It is a yellowish green, and when quite ripe, waxy yellow, with more or less red on the sunny side. Flesh pure white, very juicy, a very agreeable, vinous acid, with fine after taste. One of the best Russian table apples. It ripens the end of September and keeps till the end of February. Mr. Vochins had received it as the Crimean, and as there are other apples under that name, Dr. Regel has named it *Vochin's Crimean*. Its hardiness and productiveness are not stated.

230. Titouka.—Titus.—I do not know of this having been fruited. An apple known as Titovka is grown along the Volga, and throughout Middle Russia. We saw it every where and in quantity. Mr. Budd described it as the market-woman and car-boy apple, of those regions. In Western Russia, however, there is another apple that is known as Titovka. Ellwanger & Barry received their Titovka from Moscow, which they describe as a large handsome fruit resembling Twenty Ounce, and which they say is the largest and showiest of the New Russian, which they have tested thus far. A specimen sent by them to Ames, Iowa, was tested by Mr. Budd and myself. It is strikingly like Zolotoreff; a sample of which, I had brought from Mr. Tuttle's, but it seemed different in flesh. A sample lately sent by Mr. Goegginger, of Riga, Russia, to Mr. Willim Evans of Montreal, would seem to be this same apple, the same I believe as that described and pictured by Dr. Regel, in his Pomology.

Dr. Regel says that this apple originated at the little hamlet of Titov, between Tula and Kaluga, and received very favorable notices in the Journals of some of the Moscow Societies. He says that it is grown from St. Petersburg southwards. Dr. Regel speaks of it as green when on the tree, afterwards as becoming a yellow green or lemon color, with some red in the sun, and in the South, a blood red.

Dr. Ed. Jankowsky, Director of the Pomological Gardens, at Warsaw, in his "Sad i ogrod owocowy," says, that in Poland it is known, as the Toulski or apple from Tula. He described it as a large beautifully yellow, and nicely blushed or painted dark red, with larger or small stripes, tender, and very good. Mr. Budd thinks that the Titovka received from Veronesh is not the same in leaf as that of the Department.

236. Antonouka;—Anthony;—The Antonovka is the king apple of the Russian steppes, and I hope that this apple, in the Department list, is true to its name. Those received by Mr. Budd from Moscow, St. Petersburg, Riga and Veronesh, and perhaps elsewhere, all seem true to name, but he has no scions of it from the Department. Mr. Tuttle showed me good, healthy trees, in an orchard adjoining his own. They were not in bearing, but the fruit borne last year answered my description exactly. The Antonovka, of Ellwanger and Barry, is true to name, but it was received from Moscow.

240. Teschanka;—Lieby;—Mr. Oliver Gibbs, Jr., of Lake City, Minnesota, speaks of this as growing in Carver county and closely resembling 378 Hiberna both in tree and in fruit. The tree is spreading and irregular in growth such as nursery men do not like; fruit large rather flat in shape, tapering toward calyx; color red and streaked. Of these Lieby is a little the riper; they are good sub-acid cooking apples.

Mr. Sias says that this is identical with 374, Pendant Ear. Hardy, free from blight, of Duchess type and a good annual bearer. It was exhibited at the winter meeting of the Minnesota Horticultural Society, at Minneapolis, by Andrew Peterson, Carver County, Minnesota, but past its season.

245. Borouinka.—Mushroom.—Mr. Budd says like Duchess, but a month later.

Dr. Regel speaks of the Borovinka as one of the most important of the Russian apples, and says it is grown largely as far as the provinces of the south of Moscow. It has been grown even at the convent of Valaam, an island in Lake Ladoga. The tree is large and spreading, and stands the coldest winters of the St. Petersburg climate, bearing fruit every year and bearing very heavily alternate years. This tree is named after the family of Borovynin in the government of Tula. The fruit is large, lemon colored, with marblings, splashes and stripes of bright red. When uncolored, owing

to wet weather, it is known as the White Borovinka. And different names are given to it according to its size and color. The flesh is white—sometimes tinged with red—tender, agreeably sour with a very nice aftertaste. Some specimens had decayed in September; others kept till the beginning of December. An opinion cited by Dr. Regel gives to the Borovinka a place second only to Antonovka. I have spoken in my report on Russian fruits, of Borovinka as the family of which the Duchess of Oldenberg is a member. In this catalogue the Duchess appears under all sorts of names, yet we did not see the Duchess in Russia; neither have I yet been able to find out the Russian name for it. In the pomology by Dr. Regel, of the 144 apples of which a colored print is given, the Duchess certainly does not appear.

In the "Sad i ogrod owocowy" by Prof. Jankowsky, of Warsaw, there is given a description of Charlamowskoe which is very much like Duchess, noting also that it is known to the French as Borvitsky. In the "Deutsche Pomologie" by W. Lauche of the Pomological Gardens, at Berlin, there is a beautiful colored print of Charlamovskoe which one can scarcely believe to be other than Duchess. The description too, is Duchess, and among the synonyms are Brovitsky and Duchess of Oldenburgh. I think I have thrown enough light on this subject to render the darkness visible.

246. Plodowitka;—Prolific;—A good cooking apple but a little bitter.—Spaulding.

247. Popouka Polosatja; Popoff's Streaked;—A mild sub-acid and aromatic dessert apple, size medium or small, yet not of special value.—Webster.

252. Aport;—O'Porto;—Dr. Regel says this is one of the most popular of Russian apples grown at St. Petersburg and southward into the Baltic provinces. In color it is green and yellowish green, often with more than half of the apple covered with red. Flesh yellowish, white, juicy, and, after it is ripe, tender, vinous acid, with nice, agreeable after taste. Dr. Regel says Aport is one of the most generally liked of our table apples. It ripens in October and keeps till May. With care it may even be kept till July. It sells at high prices on account of its high color and attractive appearance. From Dr. Regel's picture it is plainly of Alexander type.

Among the many synonyms given by Dr. Regel to this apple I find Titovka, and also Kaiser Alexander of the German pomologists. The Kaiser Alexander described by Mr. Jankowski and by Mr. Lauche are much more like our Alexander.

Dr. Regel speaks of the Alexandrovskoe as grown to the south of Moscow, and describes it from samples in the collection sent by Mr. Borovinsky. It seems to be an apple of Alexander form, but much smaller and with a singularly long stalk. A yellowish apple with a little red on one side, hard in texture, but afterwards becomes tender, and a vinous acid.

262. Charlamowskoe;—Charlamoff;—An early fall apple, large and oblong, streaked with red and of excellent quality, says Mr. Oliver Gibbs. Mr. Webster speaks of the fruit as large and handsome, resembling Duchess, but more conical in form and less acid, and of much better flavor. Strange enough, the above two descriptions are exactly that of the Titovka of middle Russia. Mr. Webster on reading my description of the Titovka we saw in Russia at once thought of Charlamoff. However, with Mr. Webster the Charlamoff soon turns watery and rots, and hence is valuable only for a quick and near market. Mr. Webster queries whether his slaty soil has anything to do with this, and has ceased to cultivate it. The Titovka we saw in Russia in all stages of ripeness, and it showed no weak point such as Mr. Webster describes. [Mr. Andrew Peterson values this very highly for an early apple.—*Secretary.*]

264. Duchowoe;—Smelling Apple;—Mr. Sias says A No. 1 fruit, strongly perfumed, almost equal to the sweetest rose. The color of Red Gilliflower and the size of black Gilliflower. Season last of August. It died because grafted upon an uncongenial stock.

Dr. Regel describes the Duchowoe from samples from the province of Tchernigov and also from Baron Tiesenhausen, a yellowish green or yellow apple, with a good deal of red on one side and rather above medium in size. Flesh white, juicy, agreeable and vinous acid. Dr. Regel says, a fine looking fruit, good for table and cooking, ripe in September and will keep till December. Dr. Regel says, most highly perfumed.

275. Solotoreffka;—Zolotoreff;—Mr. Tuttle thinks highly of this as a fall market apple. It is a large cylindrical showy apple with a good deal of color. Flesh a little coarse, but juicy and spicy, with a good mingling of sweet and acid, keeps till November. Mr. Webster speaks of it as a large showy apple, very productive and ripe in October, but flattish in form and oblong, and a specimen received from Mr. Webster, Mr. Tuttle said was not like his own. Mr. Downing has expressed a favorable opinion of Zolotoreff, but which I do not know.

277. Wargul;—Wargul;—Dr. Regel says that the Vargul is one of the most popular apples at Voronezh. When fully ripe it is a yellowish green, with red on the sunny side, covering half or three fourths of the fruit. The flesh is soft, white and juicy and somewhat acid, of most agreeable brisk flavor with nice after taste. For its good looks and its flavor it is much liked both for the table and kitchen. Season from October till the end of winter.

279. Aportowoge Simowoe;—Winter Oporto.—This apple did not suggest to Mr. Sias any Alexander parentage. The fruit was below medium in size when grafted on Hislop crab; a trifle above medium, on apple root. It is more flattened and less red than Alexander. Mr. Sias has fruited it for three years and rather likes it; although it is not of fine quality. The tree seems hardy. Among these winter aports in Russia, we find some remarkably good apples; one which we tasted in the Kozlov market was just like Alexander in appearance, but tough in texture, a mingling of sharp acid and sweet, an apple of fine quality and evidently a good keeper.

Dr. Regel describes an Aport which keeps from October till May. Mr. Schroeder, at Petrovskoe Rasumovskoe, near Moscow, says Aport or Kaiser Alexander is aromatic in flavor and keeps till spring. Mr. Wagner at Riga notes his Aportapfel grosster, as a late winter apple. I mention this because Emperor Alexander, which is but another name for these apples, should be imported for trial from all possible sources in Russia.

Dr. Regel describes Winter Aport from samples received from the Garden of Mr. Atriganyev in Tchernigov. In color a light green and on the sunny side a dull, dark, red covered with carmine in splashes and stripes, covering often three-fourths of the surface. Flesh, greenish white, rather crude, sour. A good kitchen apple which keeps all winter. The colored print as given in Dr. Regel's book is strikingly like that which we saw at Tenki on the Volga, at Prince Gagarine's—a large, handsome, oblong, winter apple.

285. Repristoe Walisnoe; Turnipy Juicy.—This is a large or very large, somewhat oblong apple, rather better in quality than Alexander and about as well colored. It carries well and keeps toward winter. A showy market fruit which Mr. Tuttle thinks a good deal of. It ripens with Alexander.

236. Kremerskoe; Kræmer's;—This I saw in Mr. Sias' orchard; a rather large, tender apple of good quality. Mr. Sias seems to think a great deal of it. Season probably about September.

288. Malinowskoe; Raspberry;—Mr. Tuttle says fruit of medium size, bright red, very beautiful and mild, pleasant sub-acid when fully ripe. Flesh quite red. Dr. Regel speaks of the Malinowskoe as an apple of which he had merely seen a specimen from the garden of a farmer in the Province of Novgorod. I should describe it as a small apple with a large wide core. It is a yellowish green and on the sunny side a reddish yellow. Flesh

sweet and of use for cooking. Ripe in September and does not keep long. Tree not hardy.

Another Malinovskoe is described by Dr. Regel. A small sized, round, reddish applet grown about St. Petersburg and Moscow. Flesh white, often redish, under the skin, tender, juicy, agreeable, vinous acid, with a nice aftertaste. The tree stands the worst winters in St. Petersburg. The fruit is nice looking and recommended for table use on account of its fine flavor. Season from September until the end of winter.

Mr. Saunders, of Washington, says;—A small apple very brilliant in color, crimson. Flesh white and very juicy, sweet and crisp. According to the cut given by Mr. Saunders, it cannot be the first given above. From the description given it does not seem to be the second. See No. 340, for the Malinovskoe Lievlandskoe, (Lievlander Himbeerapfel) is the Himbeerapfel or Malinovskoe of Mr. Goeggiger, of Riga; that is I mean the same in name.

290—Ukrainskoe;—Ukraine;—I saw this in bearing at Mr. Underwood's. The fruit was large and fine, though top-grafted on crab. I saw it in bearing at Vilna in the west of Russia; a large apple like an uncolored Northern Spy. It has the name in Russia of being a hardy tree, but a light bearer of apples of second quality that keep and ship well. I rather think this apple is true to name.

304. Suislepper; Switzer;—Mr. Webster says we have a hardy, vigorous tree, a good bearer of handsome apples, valuable for home use and for market. Fruit medium to large, often covered with red; juicy, half fine, tender, with a fine sub-acid, slightly quince in flavor, more like French than Russian apples. A good keeper for its season, which is September and October. Dr. Hoskins, however, says as it bears on the ends of the shoots it is apt to fall off. Other than that, he is inclined to think highly of it. It is certainly an apple of fine quality and Mr. Downing says "Undoubtedly valuable for home use or commerce."

315. Herrenapfel; Lord's apple;—Mr. Tuttle describes this as a large fruit, the size of Blue Pearmain, with much the same color and bloom; a clear, strong, pleasant acid; an apple that hangs well on the tree and keeps longer than Longfield. Mr. Tuttle also says the tree is hardy and a good grower, so that he considers it one of the most valuable he has tested. Mr. Sias says on Hyslop crab stock, only medium in size and not quite as good a keeper as Blue Pearmain. This is evidently an Arabskoe. The Riga catalogues contain both the names of Arabskoe and Herrenapfel, although Mr. Wagner does not mark either of them as late winter. Mr. H. Goegginger says that the Herrenapfel or more correctly the Polnischer Herrenapfel is of medium size, red all over, of the first quality, and a good market apple from October to December. He says further that it is a hardy and large tree which bears very well; and he thinks highly of it.

316. Rothe Reinette; Red Queen;—This Mr. Tuttle believes to be the same as his Renet Red. Fruit of good size, dark green with red side; keeps till March.

317. Golubinoe; Beeloe; White Pigeon;—This is a small fruit, very conic in form, with wrinkled eye and no basin. A sweet apple, of fine but very peculiar flavor, and of defective texture. Both Mr. Sias and Mr. Webster speak of the extra hardness of this tree. Those who have fruited this do not speak of its defective texture and I must have tested an unfair sample. Mr. Sias says "tender and juicy."

321. Pipka Sladkaja; Sweet Pipka.—An excellent, though undersized, striped, autumn sweet apple—that died from being grafted on an uncongenial stock.—Sias.

322. Kovitszhneoe; Brown;—Like Duchess, but hardier and later in the season, and has less acid.—Tuttle.

324. Neemezki Kalville;—German Calville. Mr. Webster says, this tree is a fair grower, an early and abundant bearer. Fruit large to very large, flattened and ribbed. It is in best condition from December till January, but may be kept till March. Specimens brought by Mr. Webster to the Montreal Horticultural Society Exhibition, had much the appearance of the White Calville of France.

330. Polosatoe Naliwnoe; Juicy streaked;—Mr. Sias says: Fruit medium or above, good in quality, tree hardy. Season last of August or the beginning of September.

Dr. Regel says, that this grows about St. Petersburg and Pskov. Judging from the cuts in Dr. Regel's book it is a medium sized, conic, yellowish-green apple with a little red on one side. It seems not quite as hardy as some other Nalivs.

333. Skwosnoi Krasnoi; Red Transparent;—A sweetish apple of White Astrachan type, but more bright and attractive in color.—Sias.

334. Skwosnoi Schotoi; Yellow Transparent;—This is one of the best known of the apples in this catalogue and has been propagated a good deal in the place of the Tetofsky. Now Charlottenthaller looms up as a rival both in size and earliness.

335. Skwosnoi Selennoe; Green Transparent;—Much like Yellow Transparent, but smaller and more conical and the tree less vigorous in growth, says Mr. Webster. Mr. Tuttle says it is White Astrachan.

336. Skwosnoi Beeloe;—White Transparent;—Just like Yellow Transparent, says Mr. Tuttle, if any preference I should choose the White. Mr. Webster would leave it out in favor of the others. Dr. Hoskins says, considerably smaller than Yellow Transparent; whiter, rounder and better in quality—very like Early Harvest.

337. Scrinka;—Grayest;—I have not yet heard of this Scrinkia having been fruited. It is a popular autumn dessert apple in the Baltic provinces. Mr. Goegginger of Riga says of the two trees named Scrinka, that the red is the valuable one. This, as received from Mr. Goegginger, is not that which Mr. Budd had received from St. Petersburg. Mr. Budd says it is very distinct in tere. The fruit sent by Mr. Goegginger to Montreal this autumn was mostly a dull red, in close marblings and stripes. I mention this to enable the fruit to be identified.

338. Gruscheffka Revelskaja;—Revel Pear;—This I saw in the orchards of Mr. Sias. It is mild in flavor, being neither sweet nor sub-acid; water cored. but very nice; very good quality for an apple of that kind.

340. Himbeerapfel Lievlander;—Lowland Raspberry;—A medium sized, ribbed apple, of pretty good quality, says Mr. Tuttle.

Dr. Regel says that he has only seen samples of this from the Baltic provinces. Judging by the cut it would appear to be an apple above medium in size and roundish conic. in color, says Dr. Regel, a dull, yellow green, and with dashes occasionally and spots of red. The flesh is white, fine and juicy; has scarcely any acidity, with a slight degree of aftertaste, suggesting the taste of the strawberry; an excellent autumn table apple, that keeps from September till the new year. This tree does not stand the coldest winters very well. Dr. Regel says this is the Himbeerapfel or Malnovskoe of Mr. Goegginger, of Riga.

342. Scharlottenthaller Golba;—Charlottenthaller;—This is, perhaps, the best of the family of which the Yellow, Green and White Transparents, and Red Duck are members. Mr. Webster also places Sweet Pear and Moscow Pear in the same group. In the opinion of Dr. Hoskins it is rather larger than the Yellow Transparent, and it is thought by some to be a little earlier. Mr. Webster says, its season commences and closes ten or twelve days earlier than Red Astrachan. Dr. Hoskins, however, declares that it is not a day earlier.

343. Weinapfel Rother;—Red Wine;—This is much like Sops of Wine in appearance, and very handsome. It is below medium in size, quite acid and earlier than the Duchess, says Mr. Tuttle. Mr. Webster says, sharp, acid fruit, like Red Astrachan; perhaps a seedling of it.

350. Lapouch;—Burr;—A small or medium sized flattish apple, yellowish, white. A tart pie apple. A hardy tree and a good and early bearer, says Mr. Sias. No. 470 is the same name but whether like this or not, I cannot say.

351. Plodowitka Caudkaja;—Prolific Sweeting;—A yellow apple of medium size. The best of the sweet apples for market purposes, says Dr. Hoskins. Mr. Webster says the tree is of the Tetofsky type, and very productive. An excellent sweet apple, ripe in August and September.

355. Apot Herbst;—Autumn Orange;—Mr. Sias showed this in good condition at the winter exhibition of the Minnesota Horticultural Society from the 16th to the 19th of January last, and took second premium. Fruit small, irregular in shape, dull, greenish yellow, not valuable, at least not on Hislop Crab stock. The wrong translation of these names is much to be regretted.

364. Beel Wochins;—White Wochins; Tree slow grower, an early and good bearer. A smooth, handsome, sub-acid apple, ripe in September. Not equal to Duchess for general culture, says Mr. Webster.

368. Mirone Sacharni;—Sugar Barbel;—Mr. Webster says a good bearer, of medium sized, striped, sweet apples, for general purposes, not equal in value to Prolific Sweeting, otherwise of value. Dr. Hoskins says, a brilliant red, nice sweet apple, but too small for practical value, it will not average one-fourth the size of the Prolific Sweeting. Season, September.

Dr. Regel describes this as an apple of medium size, or below. A yellowish green or yellow with some dingy red in splashes; sometimes with a good deal of red on the sunny side. The flesh is tender, white, agreeable and very sweet, and with an agreeable aftertaste. The tree stands the coldest winters at St. Petersburg, and hence is a favoritist early apple and brings a good price. It ripens in August and keeps till December. I may be said to be good for eating, though not strictly a dessert fruit.

372. Petrowskoe;—St. Peter's;—Dr. Hoskins has characterized this as the Russian "Early Joe." He considers it better than Switzer and the best of the Russian dessert apples of its season, which is during August and September. Mr. Webster says: a good bearer of small but handsome fruit, striped with red, fine in grain, of fine flavor for a Russian; better perhaps than Switzer, but does not carry as well. I also saw this fruiting at Mr. Underwood's.

374. Wislowchoe;—Pendent Ear;—Resembles Duchess in size and color and about as prolific, but too astringent. Sias says it is the same as 240.

378. Orsimui;—Hibernal;—Mr. Tuttle especially calls attention to this as worthy of trial in the colder climates. It is an early and good bearer, of large and showy apples, blushed with red, and with large light dots. A good cooking apple, said to keep well till December. Mr. Oliver Gibbs thinks highly of trees said to be it, which he has found bearing in Carver county.

380. Gruscheffka Moskoloskaja;—Moscow Pear;—I would like to hear of this as having fruited, as in Russia it seems to be the favorite early market apple. In Middle Russias though small and white, its extreme earliness gives it value.

382. Buzkafa Selonka;—Russian Green;—This I saw in the orchard of Mr. Sias, without doubt an Anis, of the type of the Blue Anis of the Volga. It is a medium-sized apple, flat conic and five sided. Flesh crude and as yet uneatable. The fruit I saw at Mr. Tuttle's was just like it. This variety should be tried in the far north.

393. Zitsonnoe Zarskoe;—Imperial Citron;—A good grower and great bearer. Fruit of good size and fair quality, but not of special value. September. Webster.

393. Krupneena;—Enormous;—An apple of Alexander type and perhaps the largest of the August apples. It is light in color, shaded with red, striped with red, almost covered, oval and irregular in form. Somewhat coarse, but of fair quality for so large an apple, and of good sub-acid flavor. Webster.

399. Krimskaja Seloka;—Green Crimean;—Tree not thoroughly hardy and of value only for cooking. Hoskins.

402. Borsdorfer;—Borsdorf;—This is a German, rather than a Russian apple and a member of a large family. This tree has proved hardy and a good bearer with Mr. Webster. Both Mr. Tuttle and Mr. Sias say that the tree is hardier than the Fameuse. The fruit from Mr. Webster's description is small to medium, of fair appearance, firm and of fine texture, sub-acid, rich and good. Dr. Hoskins says, when perfect, it looks very much like Ben Davis in form and color, but smaller. It is a first-rate keeper for home use, although rather small for market.

407. Tchernoe Drewo; Blackwood;—A favorite winter dessert apple which sells for extra prices on the Volga on account of its fine quality. If picked early and stored in a cool place it keeps till winter or later. With Mr. Webster it ripened early and did not seem of special value. Mr. Tuttle says;—It blights. Mr. Sias says "good tree."

410. Repka Malenka; Little Seedling;—Mr. Oliver Gibbs says that this is like Duchess in form of the tree. He has seen it in Carver County, in perfect health, through growing close to other trees badly blighted. It is an abundant bearer, fruit small; quality unknown at that season. Mr. Webster speaks of it as an enormous biennial bearer, and if thinned it attains a fair medium size, and that it is too hard to be eatable till warm weather in Spring, when it becomes tender, juicy and of fair quality and flavor. Mr. Sias says that at the winter meeting of the Minnesota Horticultural Society, at Minneapolis, it was the best keeper shown. It tasted fresh and tart as if just picked from the tree.* I saw this apple at Mr. Underwoods. It seems to be of the same family as the Bogdanoff, judging by its leaf, as pointed out by Mr. Budd. The Repka of Ellwanger and Barry, received from Moscow, is a summer apple.

413. Skrischapfel; Cross Apple;—This I saw in the orchard of Mr. Underwood at Lake City, Minnesota. It is without doubt an Anis of the true Red Anis family. It was top grafted on crab, as is apt to be the case, and I was dissatisfied with the flavor of a prematurely ripened specimen. Mr. Oliver Gibbs writing to me in November, says: "That apple you saw at Mr. Underwood's and thought might be Anis only for its lack of quality, turns out, when

* This refers to the plate exhibited by Andrew Peterson.—*Secretary.*

ripe, red, high finished, good and apparently a keeper. It is undoubtedly the Red Anis." The summer heat of southern and central Minnesota in Lat. 44 and 45 is no doubt much greater than that of the Upper Volga from Lat. 52 to above 55 and we may expect to find the fruit of that region proportionately earlier in its season of ripening. [This apple failed to keep. It grew suddenly mushy in December, but possibly owing to some peculiarity of the soil or season, or from its being grown on an uncongenial crab stock.]

Dr. Regel speaks of the Skrischapfel as an excellent yellowish green fruit that keeps till the following summer, and says that the tree endures the coldest winters at St. Petersburg, and I must say that the colored plate of it in Dr. Regel's book is very like the Skrischapfel at Mr. Underwood's. Mr. Schroeder, Moscow, gives a like description of Skrischapfel, but what we saw in Russia seemed a more solid, weighty, apple than that growing at Mr. Underwood's.

429. Bosklonowka; Bosklonoff;—Sweet, bitter and worthless. (Webster.)

433. Orlowskoe; Orloff;—Mr. Tuttle says this is White Astrachan. That received from Ellwanger & Barry, fruited by myself and Mr. R. W. Shepherd of Como, Quebec, seemed to be White Astrachan. Ellwanger & Barry received from Thomas Rivers, of England.

437. Sachoiswan; Saxonian;—Striped on yellow ground. Season, late fall.

439. Krimskaja Beel; White Krim;—This is Duchess—says Mr. Tuttle.

441. Grimuschka; Rattling;—One specimen I saw at Mr. Underwood's. A large brownish red fruit.

444. Reinette Liubski; Lubsk Queen;—A very beautiful little sweet apple of no value, says, Mr. Webster. Mr. Tuttle says, although reported from the east as sweet, he finds it sub-acid. He adds further, that it is a very good fall apple about the size of Autumn Strawberry.

443. Kardinal; Cardinal;—That which I saw at Mr. Underwood's was small, striped, and of fine flavor. Dr. Hoskins describes it as a red cheeked apple, on dull, whitish green ground,—but he received his from D. W. Adams, of Waukon, Iowa.

450. Beel Krasawiza; Handsome White;—An apple of white Calville form and size, acid, crude and unripe, as I saw it in the orchard of Mr. Spaulding, at Minneapolis.

451. Warschtapel; Wartztappel;—At Mr. Underwood's. An apple of full, medium size, green with some faint red, very ribbed and wrinkled.

453. Arkad Krasiwai; Beautiful Arcade;—A hard white apple, somewhat juicy, sweet and with some flavor, which Mr. Tuttle thinks very favorably of.

455. Riabinouka; Berry Apple;—The Riabinouka as grown by Dr. Hoskins was received from D. W. Adams, Waupon, Iowa. An apple very, closely resembling Alexander, though Dr. Hoskins and others agree that they are not alike. Yet Dr. Hoskins says, there is no use in growing both; he finds the tree not perfectly hardy.

457. Klinevskoe; Klineff;—Mr. Tuttle says, fruit of medium size, yellow with red cheek. Season, fall.

458. Scholtinaliv; Yellow Juice;—Dr. Regel says this grows in the gardens of St. Petersburg, Novgorod and the Coast Provinces, and is often mistaken for White Naliv. It is quite suited to these climates and bears lots of fruit each year. It ripens in September, and keeps till November.

462. Rubez Selonui; Greencut;—The Rubets Selonui, Dr. Regel says is grown in the Coast Provinces, also at Moscow and southward; also, says Baron Tiesenhausen, in the Province of St. Petersburg. It is a medium sized fruit, yellowish green with a little red on one side. Good for cooking only. Tree healthy but not productive.

463. Pipka Postillnaja; Spreading Pipka;—A small apple of Duchess type, sour, dry, flavorless, condemned, (Hoskins.)

469. Babuschkino;—Grandmother;—Judging merely from the leaf, as examined by Mr. Budd, this would appear to be the same as that received by him from some other places in Russia.

Dr. Regel says that he received the Babuschkino from Moscow and that it is grown in that province and the provinces to the south. It seems to be an apple of full medium size, yellow, with a little red. It has an agreeable, vinous acid and aromatic flavor. Dr. Regel recommends it as a fine dessert apple, said to keep till August of the next year.

472. Ostrekowskaja Steklianka;—Ostrekoﬀ's Glass;—This I saw in the orchard of Mr. Underwood. A small, green apple, very conic and very wrinkled at the calyx, and without basin. Its length of stem I forget. Mr. Shroeder, at Moscow, describes it to me as a small, dark green apple, with dull, red sides; conic, with corrugated basin and long stem. He says the tree is hardy and that it is even a good dessert apple, and keeps till the following summer. Dr. Regel, in his work, seems to describe the same apple as a hardy tree and a heavy annual bearer, and says that it is a fruit of medium size, a native of Tula, and named after a merchant there. Mr. Budd, on reading my description, queries whether this may be the same as the Astrachan Pippin, which he received from Moscow, which, however, Mr. Budd says "is a true Steklianka and the keeper of all the keepers I have yet seen from Russia." Mr. Budd says that he took that apple to the Iowa winter horticultural meeting, jammed in a valise full of books, but it arrived sound and too hard and crude for eating. We saw just such apples in Russia, and carried them about with us to try to find out their names. The cut of this apple, herewith given, is very unlike the fruit grown by Mr. Underwood. It is from a drawing taken in the department grounds by Mr. Wm. Saunders. [The Ostrekoff Glass reported by Andrew Peterson, of Carver county, is probably untrue to name. His resembles the Lieby and the Hibernian in fruit, while all others who are fruiting from this name and number, (472) so far as heard from, describe it substantially as here given by Mr. Gibb.—SECRETARY.]

476. Arkad Rother;—Red Arcade;—Dr. Regel says that this originated in the government of Echernigov; a very scarce apple which he only saw from one garden there. He says further that it is doing well in his pomological garden at St. Petersburg, and speaks of its beauty and long keeping qualities, yet strange enough it is not on the list which Dr. Regel recommended to us for trial, nor even in his general catalogue, nor was it among the apples he sent to Mr. Budd in 1879. Dr. Regel may have lost it.

Mr. Saunders at Washington does not become enthusiastic over it: he merely says good early apple, fully ripe 4th of July. The word *Rother* would seem to imply German habitat.

477. Roschdestwenskoe;—Christ Birth Apple;—That grown by Ellwanger and Barry, of Rochester, was received from Moscow, and would hardly seem by the description to be the high conic, long stalked apple described by Mr. Shroeder. It is a valuable winter apple in Russia, and I would like to hear of it having been fruited from the department catalogue.

Dr. Regel speaks of this as grown at Novgorod and to the south of Moscow. A green and afterwards ja' yellowish green fruit dull red in the sun. Flesh white, juicy and agreeably sour, with slight aftertaste. Ripe in October and keeps all winter. It stood the severest winters until 1866, when young trees suffered. This tree will not endure 30 Raumur—that is $3\frac{1}{2}$ below zero Fahr. This apple may have taken its name from the village of Roschdestvenskago.

490. Glimzowoe;—Clay;—Mr. Spaulding says like Duchess, in tree and fruit, but it seems finer in grain, is less sharply acid, and a month later in season.

502. Russische Rambour Reinette;—Russian Rambour Queen;—Mr. Tuttle says in form and color like Rhode Island Greening, but larger. Quality good. Season early winter.

544. Lapouche Naliw; Juicy Burr;—At Mr. Underwood's, a large striped apple like Duchess.

548. Borowinka Lugouaja; Meadows Mushroom;—Large, aromatic, and good, says Mr. Saunders at Washington.

551. Arbusowskoe; Water Melon;—Mr. Sias says: a fruit nearly as large as the Duchess, and looks like it; fair in quality, but so far, a shy bearer. The specimen I tasted was woody. Mr. Tuttle says, fruit large, yellow with red cheek, mild, sub-acid. Season, late fall.

Dr. Regel quotes the opinions of Mr. Miller, to show, that this apple has been grown at Moscow, and southwards, and has probably been named after Mr. Arbusov, a merchant. It is a large oblong apple, about the largest pictured in Dr. Regel's book. The skin is green and afterwards a yellow green, the largest part of the fruit being covered with a dull red, with darker marblings. The flesh is greenish white, and of an agreeable sour taste. A large, fine looking, dessert and cooking apple, which ripens in September and keeps till December. It has stood the test of hardiness very well with Dr. Regel. Only old trees suffered during the very severe winter of 1866-7.

563. Krinskoo Nalivnoe; Juicy Krimtartar;—Mr. Tuttle says: a large, yellow, mild, sub-acid, fall apple of good quality.

568. Melonenapfel; Melon apple;—Mr. Saunders says, a fruit of good flavor somewhat tough in flesh, on August 16th. Judging by the outline it seems to be an apple of good size.

578. Borsdorfer Leipziger; Leipzig Borsdorf;—Mr. Sias says, one of the best in quality of the Russian apples, and one of the best keepers. It would seem however, that it is a conic apple, of no special beauty. The tree is hardy and a good bearer.

579. Tierlandischer Sommer;—Summer Lowland.—Mr. Tuttle says this resembles Duchess in appearance, but is of excellent quality. A very pleasant sub-acid. It is later in ripening, and should have been named Autumn Lowland. Mr. Tuttle speaks of the tree as very hardy and satisfactory.

580. Tierlandischer Winter.—Winter Lowland.—In Mr. Sias' orchard, this is a small flat apple, striped with bright red, white in flesh, quite good and probably a good keeper.

Erdbeerapfel.—Red Calville.—A hardy tree and an enormous bearer; fruit red, acid and high flavored, but rather small. Its lack of size prevents its being valuable.—Webster. Why the word Erdbeerapfel or Strawberry apple should have been translated Red Calville, it is difficult to say.

585. Zusow's Winterapfel.—Zusoff's Winter.—Mr. Tuttle tells me that he has two varieties under this name; one a small, bright red, fall apple, the other larger and a better keeper. He would not recommend them without further trial.

587. Englischer Pepping; English Pippin;—(See 161—Longfield.)

592. Arkad Dlimui; Long Arcade:—A small or medium sized fruit, much like Red Astrachan in form and color; flesh, white and fine grain, and a mild, pleasant acid. Season, late fall or early winter. Such is the opinion of Mr. Tuttle, who speaks of the tree as very hardy, a medium grower and an early bearer.

597. Pesolschnaja Stekljanika; Glassy Sand;—A small and very conic fruit, of medium quality, basin not wrinkled, as fruited by Mr. Sias. As described by Mr. Schroeder, it is a fall, sour greening. That grown by Mr. Sias may be true to name, I cannot be sure.

600. Dlimoe; Long apple;—This evidently gets its name from the tree, which has few and long branches, thickly studded with short spurs, each crowned in season with a rosette of beautiful, little red apples, of good quality, says Mr. Webster.

874. Borowinka Sladkaja; Sweet Mushroom;—A good flavored, sweet apple, of good size and rather tough flesh, says Mr. Saunders.

965. Gruscheffka Sladkaja; Sweet Pear; Not a sweet but a fine sub-acid apple, of the Yellow Transparent class, says Mr. Webster. I saw it at Mr. Spaulding's, probably the same fruit.

966. Tuchernokrasnoe; Red Black;—Mr. Sias says, one of the most showy and beautiful of my Russian varieties, and one of the largest. Color, nearly black where well exposed to the sun. A little coarse in texture but a good market apple. Season probably October or November.

970. Tuhuginka Selomaja;—Green Citron.—Medium in size, shy bearer, not profitable.—Sias.

971. Wassilli Welikui;—Vassilis Largest.—This belongs to the same family as Green Streaked, Zolotoreff, and Turnipy Juicy. Mr. Tuttle says, it is a little more like Alexander, in color and appearance of the tree, than the others, about the same quality, and like the others an early bearer, of large, showy, fall, mar-apples.

973. Stekliannoe Duschisstoe;—Shining Aromatic.—Fruit of no value here, says Mr. Webster. Mr. Tuttle says, an acid fruit, rather fine in grain, and with some flavor, not bad, but we have too many such apples.

975.—Tetnekrasnoe.—Red Teat.—This tree, says Mr. Webster, is a wonderful bearer, and the fruit if judiciously thinned, large to very large, but of fair quality and flavor only. September. It is like Mr. Webster's Zolotoreff, but not so good in quality, nor does it seem to keep as long.

978. Beel Solotofskaja.—Golden White;—Dr. Hoskins pronounces this the best late fall apple among the Russians, for market purposes; St. Peter the best early fall. Dr. Hoskins describes it as medium in size, round, with no cavity. In color, a dull, pale green, turning to a dull yellow, with a few pale red stripes in the sun. Many specimens have no red at all. The flesh is soft, a little coarse. Flavor, a very sub-acid. Mr. R. Brodie of Coteau St. Pierre exhibited in Montreal last September, a plate which seemed this variety. He has five trees of it, planted about five years, and the trees seem extra hardy, and a good young bearer. The samples shown were a good deal above medium in size, and some samples grown by Mr. Brodie have been very nearly as large as Alexander.

981. Beelwoe Scholtoseroe;—White Russet;—Mr. Tuttle says a large, yellow apple with a red cheek, a little russety around the stem. Quality good. An early and abundant bearer. Season late fall.

983. Astrachanskoe Skwasnoe;—Red Astrachan;—Not Red Astrachan says Mr. Spaulding. It should rather have been translated, Transparent Astrachan.

984. Anis Kurski;—Koursk Anisette; I saw this at Mr. Underwood's. A small, green fruit without any basin and very wrinkled at calyx, not of Anis type at all. Dr. Regel received this from Penza, but does not describe it. Mr. Sias says that it resembles Russian Green, of fine quality and keeps pretty well for a fall fruit. Evidently not the same apple as Mr. Underwood's.

985. Anis Krasnui;—Red Anisette;—A true variety of the Anis. When I saw it in August in Mr. Sias' orchard, it was not fully colored, and, in fact, it seems to have more color than the Yellow Anis growing along side of it. Not the Pink Anis we saw on the Volga.

987. Anis Schaltui;—Yellow Anisette;—This also is a true Anis. When I tasted it in Mr. Sias orchard, it was hard in texture and a crude acid. But Mr. Sias says that it does not keep past September. These were top grafted on Crab. Mr. Sias tells me that he has found in his neighborhood trees grafted on apple roots, planted in 1831. The trees seem in perfect health and the fruit about a third larger than that grown on Crab. The fruit, however, ripened in the fall and did not keep. This and the Red Anis above noted, and 332 Green Russian, and 413 Skris chapel or Cross apple, are true varieties of the Anis may prove of great value in the far north.

988. Ananasnoe;—Pine;—Like Yellow Transparent at Mr. Underwood's.

PHYSIOGRAPHIC CONDITIONS OF MINNESOTA AGRICULTURE.

BY PROF. C. W. HALL, OF THE UNIVERSITY OF MINNESOTA.

Minnesota, the center of the continent; Area—land and water—arable—prairie—forest; Forest Trees—cut of pine; River Basins—extent of each; Altitudes of rivers, towns, lakes; Distribution and kinds of Lakes; Drift—its origin and character; Soils now formed—elements of—effect of rain; Rainfall—in the United States—in Minnesota—its relation to fruit culture; Temperature and Climate—changes of with altitude and distance from the equator; Conditions of successful farming; Forests and Rainfall.

The State of Minnesota occupies so central a position on the North American continent, that Pigeon Point, its northeasternmost extremity, is but two hundred miles nearer Eastport, Maine, than is St. Vincent, its northwesternmost point, to Astoria, Oregon; while starting from its capital city, one must travel but four hundred miles further in a direct line, to reach Bhering Straits, than to reach the Isthmus of Panama.

Its southern boundary line coincides with parallel $43^{\circ} 30'$ and its northern line, except for an area of about one hundred and

twenty square miles in the Lake of the Woods, extends but to parallel 49°, the northern limit of the United States; to the east, Pigeon Point extends but a mile or so eastward of meridian 89° 30', and to the west the 97th meridian line passes through St. Vincent township.

The area included within the commonwealth is so beautifully diversified in character, that of the 84,286 square miles of surface within its boundary lines, 78,648 square miles only is land: the other 5,638 square miles being made up of numberless small attractive lakes scattered over its face.*

This estimate of water surface does not include the portion of Lake Superior lying within the Minnesota borders.

The 78,648 square miles of land, equivalent to 53,943,379 acres, furnishes 45,000,000 acres which are thought capable of being brought under the plow.

This vast extent of country is further diversified by forest and prairie, giving an aggregate of near 48,000 and 31,000 square miles respectively, and exclusive of the water area. Although the forest regions lie chiefly to the northeast and the prairies stretch away with broader expanse to the south and west, yet the division is by no means sharply defined, large prairie districts being seen within the timbered area—as Long Prairie River valley, in Todd county, and Long Prairie in Morrison county; while the "Big Woods," a large forest belt, forty to fifty miles wide, extends from the forest regions of the north as far to the south as Blue Earth county, and belts of timber are not infrequent upon the plains, especially around the lakes and marshes and along the river courses.

Watonwan and Minnesota rivers, and Crystal Lake in Waseca county, furnish notable illustrations of this fact.

The pursuits of agriculture are gradually effecting a change in both the flora and fauna of Minnesota; the wild grasses and sedges and the brilliant prairie flowers are slowly but surely disappearing toward the west and giving place to the cultivated species already so abundant in the settled portions of the state; while the wild beasts, once valued for their rich fur and sought as food, no longer inspire terror in the hearts of the settlers and are only occasionally seen as they stray from the haunts where they have found retreat.

The forests furnish both hard and soft wood; oak, maple, elm and birch, bass-wood, soft maple and cotton-wood are found in greater or less numbers. The evergreens grow abundantly, pine taking the lead; it is to the state of greater economic value than

*Hon. H. H. Young, Secretary of the State Board of Immigration.

all other trees. According to Prof. Sargent, Forestry Bulletin No. 5, 10th census of the United States, the total amount of standing pine, May 1880, in Minnesota, was 6,100,000,000 feet, board measure; while the amount cut during that year was 1,550,000,000 feet.

The original limits of the pine area upon its southern and western sides was nearly as follows: Beginning at the eastern boundary of the state a little above Taylors Falls, the line extended westward through Isanti, the northeastern part of Benton, through Morrison, Todd, Otter Tail, Becker, Polk, Marshall and Kittson counties. At the present time, much of the pine bearing land within that area has been cut over, and the above figures of lumber yield will give one of a speculative turn of mind an opportunity to calculate for himself how soon the practical exhaustion of our pine will occur,—an event which will throw upon our state large tracts of land generally considered of but little value to the agriculturist, but which will nevertheless exert their influence upon the climatic conditions of the state.

Three grand drainage systems take their rise in Minnesota; the Hudson Bay, the St. Lawrence and the Mississippi. The areas drained by these basins through their several tributaries are as follows:

The Hudson Bay—

Rainy Lake River.....	11,347 sq. miles.
Red River.....	18,106 “

The St. Lawrence—

The St. Louis river and other streams.....	7,689 “
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The Mississippi—

Minnesota River (in Minn.).....	15,706 “
Tributaries of the Missouri in Southwestern Minnesota....	6,399 “
Des Moines River.....	1,639 “
Cedar River... ..	1,209 “
St. Croix River (in Minn.).....	3,669 “
Other tributaries of the Mississippi below St. Paul.....	6,399 “
Mississippi river above Ft Snelling.....	16,596 “
Total	84,286* “

The state is not high above the sea; the four corners give respectively the following altitudes: The Mississippi at low water mark is at La Crosse 626 ft. above sea level, Lake Superior 602 ft.,

*The above areas were computed with much care from the last edition of Warner & Foote's map of Minnesota, and are believed to be very nearly correct.

St. Vincent 758 ft., and Pipe Stone City 1577 ft., while along our water courses we find the following altitudes:

Winona.....	640 feet...
Red Wing.....	665 "
Hastings.....	670 "
Stillwater.....	675 "
St. Paul.....	676 "
Minneapolis.....	791 "
St. Cloud.....	953 "
Brainerd.....	1200 "
Moorhead.....	904 "
Breckenridge	948 "
Fergus Falls.....	1062 "
Mankato.....	748 "
New Ulm.....	837 "

Among our prairie towns some of the highest points may be found as follows: At the summit, between Hatfield and Pipe Stone City, the highest point on the Southern Minnesota R. R., the altitude is 1744 ft. above the sea; Dodge Centre, on the Winona & St. Peter R. R., is 1288 ft.; Bird Island, on the Hastings & Dakota R. R., 1089 ft.; near Kandiyohi, on the southern division of the Manitoba, 1255 ft.; mile post 138, on the St. Cloud division, is 1403 ft.; Frazee City, on the Northern Pacific, east of Brainerd and near the divide between the waters of the Mississippi and Red Rivers, is 1431 ft.; while the Leaf Hills, a range "five to three miles wide, composed of very irregular, roughly outlined hills, 100 to 300 ft. high," stretching in a northwesterly direction from the borders of Todd county, through Becker and Otter Tail counties, and disappearing in the low range which merges into the old raised beaches of the glacial Lake Agassiz, reach an altitude of 1750 ft. above the sea; while many of the summits of these hills show elevations between 1500 ft. and that figure.

Many towns and villages nestled in the valleys, along the streams and beside the many lakes of this section of the state, often at an elevation of 1,500 feet and upwards, testify to the inviting salubrity of the crisp and bracing atmosphere.

The highest part of the state is the Mesabi—the Chippewa word for dividing ridge—the range of high land separating the waters of the Rainy Lake River basin from those flowing east and south into the St. Lawrence and the Mississippi.

The continental foldings of the earth's crust are not strongly marked in Minnesota; there are no high ridges nor deep valleys, such as are seen along the Atlantic and Pacific slopes of the continent; nor has water, along the Mesabi, exercised that wonderful

erosive power so manifest among the Alleghanies of Pennsylvania and in the Rocky Mountains of Colorado and Arizona; hence this part of the state is characterized by ranges of low hills separated by shallow valleys.

This general fact becomes noticeable: Minnesota, as a whole, is a level state, the surface being made up of a southern portion of vast prairie tracts varied with wood, lake, slough and low elevation; then a central belt reaching from east to west, with timber prevailing in the eastern part, and furnishing, further west, much land of exceeding fertility but interspersed with low, swampy and often sandy and barren tracts; further a heavily rolling prairie stretches away through the western half of the state, furnishing a setting for thousands of the little lake gems which keep the air of Minnesota sweet and make the scenery far sought by summer tourists; and, finally, a northern belt, as yet unsurveyed in part, and but little known, extends from Lake Superior across the Mesabi and westward to the Red River of the North. This latter tract includes Sawteeth range and skirts the north shore, where some of the peaks reach an altitude of 1,800 or 2,000 feet above the sea level. Hence for surface features, as we pass from the river bottoms and old lake basins of the Mississippi and Red rivers and the southern portions of the state, to the higher level prairie of Mower and Martin counties, the hilly regions of Otter Tail and Becker counties, or finally to the only part which can claim the dignity of a place among the mountainous districts of the country, we may well conclude that Minnesota furnishes a richly diversified scenery.

Of lakes we have both ancient and existing, of the latter at least 8,000; Andreas gives in his latest atlas 3759 in the surveyed portions of the state, and Terry* estimates 10,000 from what he knows of the unsurveyed portions. These lakes average rather small with the aggregate area already given—5,638 square miles. Indeed, they range in size from a pool merely large enough to throw a chain carrier from his course to the dimensions of 340,000 acres in Red Lake, 130,000 in Mille Lacs and 114,000 in Leech Lake.

These lakes may be classified under three distinct types: first, enlargements of river channels, of which class lakes Pepin and St. Croix furnish illustration; formed where, through the deposition of river silt by the inflowing of other streams, the channel has been dammed up and the waters made to set back and form a large

*See a highly interesting chapter on the Hydrology of Minnesota, by the late Rev. C. M. Terry, in the Ninth Annual Report, Geological and Natural History Survey of Minnesota, p. 314.

sheet; second, those having rock basins formed either by glacial erosion or through the interruption of a geological formation as shown by Lake Saganaga, on the northern boundary of the state; and in the third place the glacial lakes, of which class lakes Minnetonka and Heron are types. Lakes of the last named class are by far the most numerous; they lie in the valleys left by the moraines of the retreating masses of ice at the close of the glacial period. In shape they are more irregular than the lakes of the other classes as they fit in between or wind around the moraine ridges, as their contour will permit. We do not find them equally distributed over the state since they owe their distribution to the retreating ice sheets of the succeeding glacial waves which swept over the state, each one weaker than the preceding and constantly northward bearing till the southern limit wholly left the state, and the Red River began to flow northward and the source of the Mississippi was changed to what is now the northern central portion of Minnesota. For the origin and law of distribution of the glacial lakes, therefore, we must look to geology; the scope of this paper will only permit us to call attention to this fact, that where the piles of glacial debris lie thickest and highest, there we find these sheets of water most numerous.

A glance at the map will show that a belt some 50 miles wide, extending northwesterly from Lake Minnetonka through Otter Tail with its 430 lakes, into Becker county, turning a right angle toward the northeast, and crossing into the Canadian dominion, will include that part of the state which contains the greatest number of lakes.

The altitude of these bodies of water is not great, as the following figures show:

Lake Minnetonka.....	922 feet.
White Bear.....	910 "
Mille Lacs.....	1346 "
Itasca.....	1500 "
Red Lake.....	1140 "
Otter Tail.....	1325 "
Lake Ida.....	1400 "
Eagle Lake.....	1125 "
Lake Miliona.....	1400 "
Heron.....	1405 "
Lake of the Woods.....	1062 "

Of river expansions we have:

Lake Traverse.....	.970 feet.
Lake Pepin.....	.664 "
Big Stone Lake.....	.962 "
St. Croix.....	(low water) 655 "

And the rock bound lakes of northeastern Minnesota, show altitudes ranging from 1400 to 1900 feet above the sea.

The altitude of these lakes outlines pretty clearly the average height above the sea of the surface of the state. As a rule, the river valleys, as the Mississippi and Minnesota, are narrow and then bluffs rise abruptly from them, hence they can form no large element in striking an average of altitude; so too with the hill regions. Some peaks of the Leaf Hills measure from 1,400 to 1,750 feet. The Sawteeth peaks sometimes reach 2,000 feet or more. The Mesabi probably in no case reaches 2,400 feet. A careful study then of the foregoing altitudes, with an inspection of the charts of altitude* lead to the conclusion that the state will average, not far from 1,200 feet above the sea. Nearly all the prairie region of the southern half of the state lies between 1,000 and 1,400 feet altitude, and it is only in the southern counties where the altitude exceeds the last named figure. These highest portions of the state seem to owe their height to the drift, a deposit which has several times been mentioned in the foregoing pages. *The Drift* is a material which has been deposited over nearly the entire state through the agency of ice. These masses of ice, whatever may have been the cause which produced them, whether it was the precession of the equinoxes or the earth's inclination to the ecliptic, or the elevation of the earth's crust to an extraordinary height, or whether it were neither nor all of these, but rather, a hair or two, so to speak, from the tail of Donnelly's comet, the results, as we see them today, have a far-reaching effect upon the agriculture of our state. The depth of the deposit is quite variable; it lies much thicker over the western half of the state than over the eastern, where the underlying rock is frequently seen exposed along the streams and in the hillsides; in the western part the rocks in place are almost never seen except in the river valleys where running water has laid them bare by removing a considerable thickness of overlying drift material. Another means of estimating the thickness of this drift is furnished in digging or boring wells. Frequently 150 feet or even more of sand is passed through in the western part of the state in sinking a well, while in the eastern half, 30 or 40 feet will bring one to the limestone or granitic beds beneath. And there are two portions of the state where no drift appears: these are Pigeon Point, in the northeastern and a section in the southeastern corner of the state, comprising Houston county and part of Winona and Fillmore counties. Various conjectures have been offered for this phenome-

*The charts exhibited were prepared from data collated by Mr. Warren Upham.

nal occurrence of bare patches in the midst of a drift covered region, like islands in the sea. Among the latest theories is that of Professor Chamberlain, of Wisconsin,* who suggests that that part of the broad continental ice sheet crossing Iowa from the northwest, in passing over the elevated ridge of Keeweenaw Point and the Wisconsin Highlands, was thinned out and held back till its force was expended and the ice mass melted before this driftless area was reached. As the ice sheet on either side of this high land moved on unintercepted, the lobes flowed together and again formed a continuous mass. But Pigeon Point is narrow and the hills around Grand Portage abrupt, hence the drift accumulations left upon the rocks in that corner of the state, have been almost wholly washed into the lake by the snow and rain of a few thousand years.†

"In listening to your lecture before the Horticultural Society, I noticed one assertion made by you, as before by Prof. Winchell in the first volume of the final report of this survey, now in press, which I cannot agree with. This is, that a considerable tract north of lake Superior in the extreme northeastern part of Minnesota is *destitute of glacial drift!!!* To be sure, the deposition of drift there is by no means so great as in central and western Minnesota; indeed the bald rocky hills (like the surface in extensive tracts near Salem and Lynn, Mass.) appear to have been swept by the moving ice-sheet almost as clear of all surface material as possible, leaving the same only in the lee of the jutting ledges and hills of rock. But in my opinion it is *very erroneous and misleading* to call that a "driftless region." ALL THE MATERIAL THERE IN WHICH TREES AND VEGETATION TAKE ROOT MUST BE GLACIAL DRIFT, and of course timber and herbage cover all that is not bare rock. We have such tracts among the hills in some parts of New Hampshire; and I have no doubt that in some of the sheltered places in the lee of hills of rock and in hollows between ledges, the glacial drift in that northeastern part of Minnesota occurs in depths varying from a few feet to even fifty feet."

The character of this deposit varies considerably. By far the larger part is what is denominated by geologists, "Till." This is a term used "to designate a compound mixture of boulder, clay, gravel and sand, formed by glaciers, constituting their ground moraine." In Stearns county, boulders of enormous size are seen, sometimes weighing hundreds of tons. And all over the state wherever this Till occurs, boulders of various sizes from the masses mentioned down to mere pebbles are abundant. If we

*Geol. of Wis., Vol. I, p. 270.

†After the MS. of this paper was prepared for the press, the following postscript to a note was received from Mr. Warren Upham, Assistant Geologist on the Geological and Natural History Survey of Minnesota :

examine the walls of a railroad cut or a water-worn gully by the road side, we shall see a confused mixture of gravel and sand, and quite likely diminutive beds or lumps of clay or perhaps the boulders, gravel and grains of sand are packed into a matrix of clay. Sometimes the material is assorted or stratified, a condition produced by the action of water and evidently during the retreat of the glacier and while the water formed standing pools or lakes. These stratified layers, especially of sand and gravel, are frequently recognized in well digging by the sudden inflow of water. These stratified or bedded layers are of great extent, often overlying the Till, and are of much economic importance to other classes than the agriculturist. The brick and pottery clay as well as the building sand of our state come from this source. In color this drift is blue in the western part of the state and red in the eastern. Not only the red color, but the scratches upon the rocks where these are laid bare and are legibly preserved, as well as the general trend of the hills themselves, point to the red sandstones and conglomerates of the Lake Superior basin as the source of much of the material of those red beds; while the chains of hills in the western part point as clearly to a northern source of the material constituting their mass. Attention is called to this drift, because it, with the decaying vegetable matter upon the ground, is the source of the soils in all the drift covered parts of our state. Since, as a general proposition, it may be stated that the mineral constituents of all soils are derived from disintegrated rocks, it is evident that soils may be found either where the rocks are decomposed, *in situ*, or where running water has deposited this material which is the result of disintegration. In either case since there is so little variation in the composition of vegetable mould, the soil preserves the general characteristics of the rocks from which it is derived, its fertility depending upon its depth, fineness, proportion of mould, etc. A soil formed from a limestone will grow luxuriant grass and form a paradise for flocks. A granitic country is rather barren through the slow disintegration of the rocks, except where the valleys hold the accumulations of long periods for the use of the farmer or the gardener. Sandstone tracts possess the natural conditions for fruit culture, and Ramsay* emphasizes the fact that in Great Britain the fruit "orchards celebrated for cider and perry, lie for the most part on the structures of the old and the new red sandstone;" and he adds: "What may be the reason of this relation I do not know; but such is the fact,

* Physical Geology and Geography of Great Britain, p. 570.

that soils composed of the New and Old Red Marl and Sandstone are generally better adapted for such fruit trees than any other in Britain." The clays are the soils in which the hop vine and the cherry flourish. But here with us, through the agency of that original Minnesota plow, the glacier, all these different types of soil are mixed in utter confusion so that granites and schists, sandstones, clays and limestones have been ground together and mingled until all conspicuous characteristics, all individuality, has been lost; color has been changed — the red of Lake Superior sandstone has become paler while the blue of Cretaceous and Tertiary beds has lost its tone and a dark color is given by the growth and transformation of the vegetation of many years. Possibly the blackening of our prairie soils is owing to the frequent fires which sweep over them.

The great advantage of this interchange of conditions lies in the wide diversity of crops it allows. Grasses and grains, fruit, flax, and amber cane can be grown side by side, and a full yield of each may be expected and that for many years without renewing the soil.

Yet plants will not take these mineral substances in the forms in which we see them.

The wheat plant will not stiffen and support its head with the silica as we see it in the quartz crystal and in the quartz grains of the granite, nor will the Indian corn take the phosphoric acid, the potash and the magnesia so necessary for its perfection, in the form in which those substances usually come to us; but decomposition, solution and recomposition are necessary, oftentimes, to bring them into the proper service of the plant. As water is the universal solvent, so powerful in its action that nothing known to man can resist it, as it occurs everywhere in the air and upon the earth, as well as within the firmest known rocks, it is natural to look to it as the most powerful agent in the preparation of the rocks for the growth of plants.

The conditions which influence rainfall are numerous; among them proximity to the sea, altitude above its surface, level or broken condition of the face of the country and direction of the winds furnish some of the principal causes which influence humidity and its precipitation.

Situated as Minnesota is, at a long distance from any mountain system, and at an even greater distance from the sea, with a level surface, and lying midway between the equator and the pole, the rainfall cannot be great; nor can it under the same conditions be strikingly small.

We find from an inspection of rainfall statistics of the United States census for 1880 that our annual fall is very near the average of the whole United States. That report gives the average for the United States, exclusive of Alaska, as 29 inches, very nearly, while a record kept by Wm. Cheney, at Minneapolis, for the last eighteen years, gives 28.27 inches as the average.

The north and west portions of the state, however, show a fall somewhat less than this, according to the census report above referred to. An inspection of the tables arranged by Mr. Schott and published in the Smithsonian Contributions, vol. 18, discloses some other interesting facts, among them that the least amount of precipitation for any year was in 1864, with but 12.06 inches at Fort Ripley, and 14.86 inches at St. Paul, while the wettest year was in 1849, with 49.64 inches at St. Paul. The next great annual precipitation was in 1881, with 38.76 inches. The extremes are 57.63 inches apart.

If we turn to Iowa we find that within the same period the driest year was 1882, with but 18.58 inches of rainfall at Sioux City, and the wettest 1858 with 65.90 inches at Fairfield, while but 19.81 inches fell at Fort Ripley in that year.

Passing toward the gulf we find the average to be, at

Davenport.....	39.5 inches.
St. Louis.....	42 "
Memphis.....	49 "
Vicksburg.....	55 "
New Orleans.....	60 "

These figures show that the nearer the Gulf the greater the rainfall, and prove that where no disturbing influences are present, precipitation is most frequent where evaporation is most abundant—one of Nature's grand laws of compensation.

Let us carry the comparison a step further, this time toward the east, and into the great fruit raising state of Michigan. The highest authentic record was in 1858, of 52.42 inches, at New Buffalo, preceded by 52.06 inches, at Grand Rapids, in 1855, while the minimum measure was 11.70 inches at Fort Mackinac, in 1851, and an average of 26 inches in the "Fruit Belt," so called, which gives a showing to the effect that fruit culture does not depend upon excessive precipitation.

Of the two feet four inches and more of water, which year after year falls in this state, in a vast sheet over our 54,000,000 acres of land, giving over 21,600 barrels of water to every acre, an average of 16,250 or more than seventy-five per cent. sinks

through the soil and into the earth to be carried off in subterranean streams; at all events it never appears in the discharge of the rivers draining the state, according to the best of capacity measurements thus far made. These streams carry away only a fraction over twenty-four per cent., if the records of Humphrey and Abbott are taken as a basis of estimate. While rainfall remains the same from year to year the discharge through streams is becoming less. The water which remains to work its way through the soil and underlying rocks, after taking solvents from the air, and additional solvents in the way of acids and alkalies absorbed from the soil, has its disintegrating powers vastly increased.

When we see the firm granites, schists and limestones crumbled and transformed, as in the Minnesota and Mississippi valleys, there can be no wonder that this drift material with its boulders, pebbles, gravel, sand, marl and clay, in its porous condition, is being rapidly pulverized and its lime, magnesia, potash, soda and ammonia in their various compounds, making the sum total of plant food, are imparting to the soil that variety of composition so essential to the best results in a diversified agriculture.

Where these subterranean streams formed beneath our state flow, before they find their way to the universal ocean, is not for us to know nor to speculate about at this time. Many of them appear in springs so filled with mineral matter as to be hard or alkaline; others have properties so pronounced that they are much prized for their medicinal value.

Springs of soft water are rare here; the reason for this is hinted at above.

The temperature of Minnesota is another subject of vital importance to the agriculturist. Our 10,000 lakes form a vast reservoir of heat of which a single computation may give a more definite conception. According to Terry* the lakes will give an average, taken at their highest temperature, of about 75°, or 43° above freezing point. Ten feet may be taken as a fair average of depth for the 5638 square miles of water surface, thus giving 10.68 cubic miles of water. Each cubic foot will contain about 1,250,000 foot pounds of heat, or heat enough to raise a weight of 1,250,000 pounds one foot from the earth, thus giving to the whole bulk of water the enormous power of 1,962,639,360,000,000,000 pounds! In other words there is heat enough stowed up in our Minnesota lakes each summer and given off during the cooling autumn to

*Geol. and Nat. Hist. Sur. of Minn., 1880, p. 314, *et seq.*

raise a block of granite as large as a township and 100 feet thick to a height of over 800 miles above the level of the sea.

Yet with all this stored up heat, representing a power compared with which that at the same time buried in the earth is as a Corliss engine beside a mere toy, our climate is subject to sudden changes. With nothing to break their course the northerly and northwesterly winds are cold—those of winter sweeping down over the prairies of Dakota, extremely so. The difference between the warmest summer day and coldest winter night is about 120° . Our average temperature for the 18 years ending with 1883 was, according to Mr. Wm. Cheney, 42.52° . With this general average we have an average January temperature of near 12° and a July average near 71° , which latter figure certifies to a climate capable of ripening the finest grapes. But the averages are not what the farmers fear; the sudden changes and the *minima* are destructive. All parts of the country away from the seaboard are subject to these abrupt variations, yet the climate is affected but slightly by them. The two factors having a constant climatic effect are—distance from the equator and elevation above the sea. According to Prof. Samuel Haughton* the variation for our latitude and longitude is 2.20° Fahr. for each degree of latitude, a co-efficient which is true for only a small part of the earth's crust. For if we pass north or south, east or west 10° a different coefficient is found. So, too, in the variation of the temperature with the altitude the co-efficient is found to vary with different continental areas and even with different parts of the same continental area. For the central position which Minnesota occupies, the reduction in temperature must be taken at about one degree for every 350 feet altitude. For example Chatfield, at a height of 1285 feet, will average, other things being equal, nearly two degrees colder than Winona. But the exposed situation of the former and the protected situation of the latter, no doubt make a greater difference than mere altitude would suggest.

Both rainfall and temperature are modified by other circumstances than altitude above the sea, geographical position and direction of mountain chains. The condition of the soil and the distribution of forest and prairie, must be taken into the account. Prof. Aughey, in his work entitled *Sketches of the Physical Geography and Geology of Nebraska*, points out the gradual increase in the rainfall of that state due to breaking the prairies and making the soil lighter and more porous under the plow. By this means much

*Six Lectures on Physical Geography, Dublin, 1880, p. 103.

of the water which formerly ran off the hard, well trodden sod, as from a roof, is now held absorbed by the earth until it is removed by evaporation and filtration into the rock strata below. The Professor also calls attention to the fact that the streams are becoming larger and that springs are now flowing where once water could not be obtained.

The question as to how much the cultivation of the soil changes the climatic conditions of any part of the globe is a large one, too large to be settled by one or two facts. Were that not the case we should need go no further than Nebraska and Minnesota to elaborate a law. For it has been stated that the average rainfall at Minneapolis for the past eighteen years was 28.67 inches; while that at Fort Snelling for the eighteen years between 1837 and 1854 inclusive, was 25.30. Great caution must be exercised in generalizing from statistics of any sort, and it will take more than two states or a few decades to establish a law governing all.

Briefly there have been enumerated some of the physiographic features of our state which affect the energies of its people and their industries, and most of all, agriculture, in its several branches.

The three conditions of success in farming are: climate, soil, and cultivation. It has been the aim of this paper to consider only the first two and some of the conditions and attendant phenomena which cluster around them.

These questions of environment must be faced by the farmer, and his relations to them clearly understood.

The following question was asked by an auditor:

Do not collateral observations show that tree culture promotes humidity and increases rainfall and also decreases the liability to sudden changes of temperature?

Answer:

The experience of European countries and of the Atlantic Coast States and Canada has called special attention within the last ten or twelve years to the climatic influences of forests. Investigation has thrown much light upon the subject during that time. Still enough is not yet proved to silence all questioning. As clear a thinker as Aughey, in his *Physical Geography and Geology of Nebraska*, already referred to, says: "The statistics of forestry in the east, in Europe, in Asia, show that forests modify temperature, the violence of winds and equalize rainfall but do not increase it,"

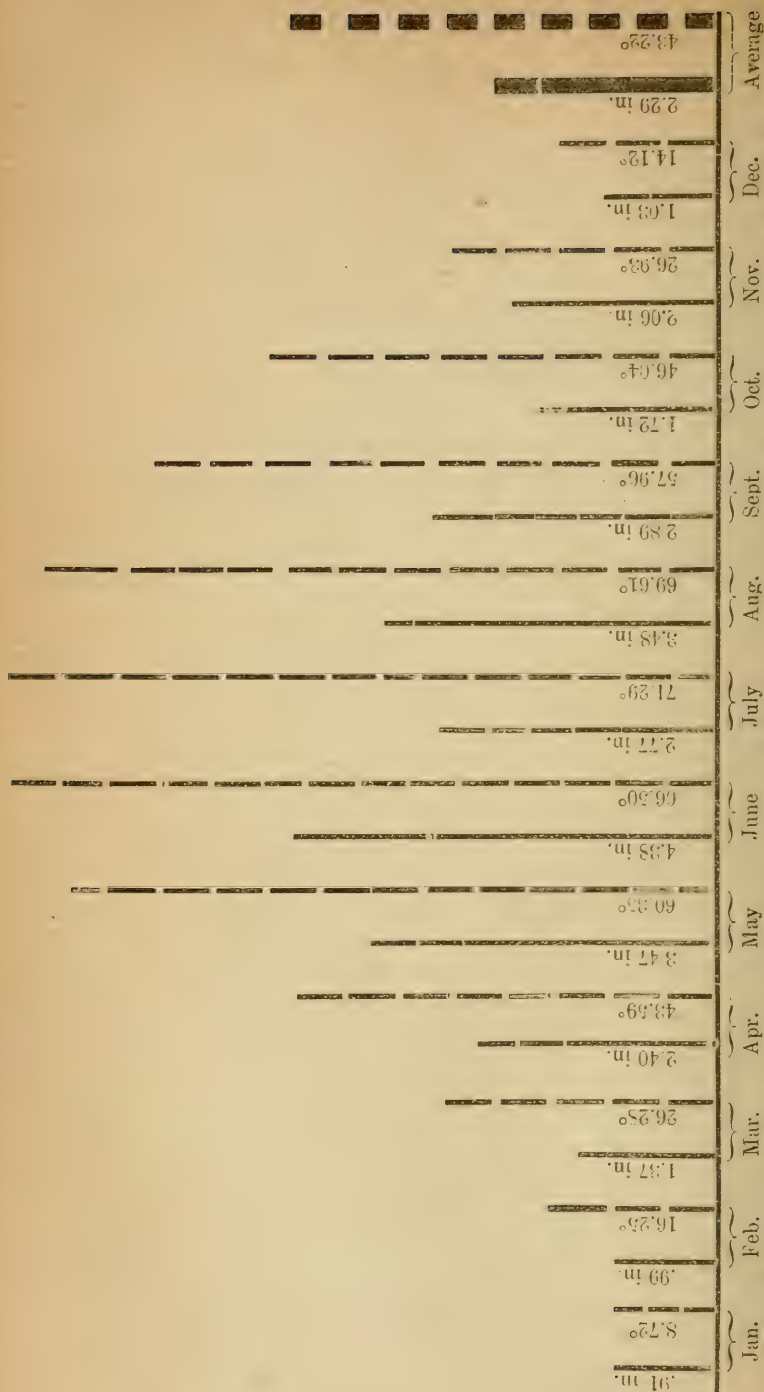


Fig. 1 Showing the average rainfall of each month for the period of twelve years, scale one-half, and the average temperature of each month, for the same time, in Fahrenheit degrees.



Fig. 2. The annual rainfall at Minneapolis, according to the records of Mr. Wm. Cheney, for the past eighteen years, and the average, per annum, for the same time. Scale, one-twelfth.

(page 44.) He further emphasizes the fact that we must increase the absorptive power of the soil to cause an increasing rainfall.

On the other hand, in France experiments have been made which seem to prove, for that particular locality, that forests have a direct influence upon the supply of atmospheric moisture and rainfall. In one instance, the result of six months' observations showed the difference in rainfall in favor of the forest and against the open country was 8 per cent. and in atmospheric moisture was 1.3 per cent.* It is clearly apparent that forests make the soil light and porous, whereas prairies have a firm and compact soil; forests produce coolness and dampness of the atmosphere and hence rain, whenever warm and cool currents come in contact. So far as forests maintain coolness in the air they prevent that intense heating which is the first condition of a cyclone. Yet terrible wind storms occur in wooded districts, and to the north of the cyclone belt, as the almost impassable windfalls in northeastern Minnesota show. These two considerations mentioned seem to be uppermost in the minds of farmers in discussing the subject of tree culture; but a third, which seems to me to be of equal importance, has just been stated by Mr. Phipps, of Toronto: "There is nothing now better known to the world of science than the fact that any deforested country will cost the cultivator at least four or five dollars more per acre to obtain the same crops which nature would have assisted him to procure had a proper interspersion of reserve remained to continue the natural moisture and preserve the natural fertility of the soil."† Such a statement appealing so strongly to the farmer's pocket and announcing so heavy a tax upon his capacity for work should be rung in the ears of every tiller of the soil until all responsibility can be left with him. Therefore the briefest answer to the question is, *Yes*.

*Popular Science Monthly, June, 1875, p. 20.

†Report on the Necessity of Procuring and Replanting Forests. Compiled at the instance of the Government of Ontario, by R. W. Phipps, Toronto, 1883. A work which should be in the hands of every farmer in Minnesota.

IMPROVEMENT OF FRUIT TREES BY SEEDLING CULTURE.

BY D. A. ROBERTSON, OF ST. PAUL.

The growing of apple trees of Russian origin in the climate of Minnesota, having been established by successful experiment, gives assurance of future success in producing improved seedling varieties of standard trees of pears, cherries and plums, which may be grown with the same success as apples.

We should follow the example of Russia, where the climate is so nearly like our own, by producing new varieties of superior quality, from a selection of our own home grown seedlings, and no longer depend upon foreign born trees. In this way only, have all the orchard fruits (and all other edible fruits and plants) been improved from their wild, original ancestors, to their present noble types of civilized excellence. Trees of warm winter climates can never be naturalized to a very cold winter climate, or naturalized at all in distant regions, without losing some of their best qualities. To become perfectly naturalized and thoroughbred in any change of surroundings, trees, like animals, must be born again as seedlings, and of all plants, this is most positively observable in fruit culture. Unlike annual and herbacious vegetation, we cannot, without much greater expense than profit, invent means to shelter our standard trees from the severest cold of our winter months, and we must not forget that in our coldest winters, which recur every few years, the temperature as indicated by the Fahrenheit thermometers, occasionally, in some parts of the state, sinks as low as 40 degrees below zero, and in the extreme north of Minnesota to some degrees lower. Temperatures as low as these do not prevent the healthy and fruitful growing in Russia of the standard orchard trees just mentioned. These Russian trees are the result of successive improvements in seedling culture. It should be mentioned, that by judicious forest tree protection, our climate will no doubt become, before very many years, greatly ameliorated, and then our orchards will be much less exposed to the meteorological severities of the different seasons.

As my present purpose is to show that our surest way to the highest possible excellence in fruit tree culture, is by systematic and successive improvements in the growing, fruiting and selection of seedlings, a brief notice of the progressive history of American fruit tree culture may not be without some entertainment for those who have not considered this subject.

The original standard orchard trees of this country, as the apple, pear, cherry, peach and plum, were nearly all imported from Europe during colonial times, and some of them as late as in the beginning of this century. As the expense of importing these European trees, which were mostly of the best grafted kinds, was greater than nearly all the New World farmers of that time could afford to pay, and as these farmers generally desired the luxury of orchards, they were compelled to depend for increase of trees upon the planting of seedlings, which costing little, became very numerous and extensive. The seedling fruits were, of course, generally very inferior in quality as compared with those from the original grafted European trees. The foreign importations of fruit trees were chiefly from England, the native country of most of the colonial settlers, to which must be added the lesser importations of the German and French old settlers, and the importations of amateur fruit growers, in later years.

But the most interesting and important fact in this survey, is, that if nearly all the colonial farmers had not been compelled by their pecuniary necessities to resort to the growing of seedlings in order to become able to plant any kind of orchards, the United States would not have produced the great and most splendid varieties of standard fruits, which now distinguish this country, above all others for their superior excellence. From the vast number of seedling orchards thereby introduced, all the best American varieties were obtained, and by graftings, scattered broadcast throughout the old states. With these graftings, and the consequent great increase of commercial nurseries, the nursymen were able to supply every demand, until it was discovered that the approved varieties furnished by the old commercial nurseries were not adapted to the climates of our extreme northwestern states. This was a fortunate discovery for Minnesota. These more western states are compelled by climate, as were the colonial farmers by pecuniary necessities, to resort to the growing of seedlings to obtain the varieties best adapted to our climates, and for the greatest possible excellence. In this grand work our North Star state is the pioneer, has taken the lead and, I doubt not, will keep it, and achieve the

greatest honors and most substantial rewards; extending its list of apples from the beautiful and excellent early winter variety, the Wealthy—in whose production our state has been so much honored and benefitted by Peter M. Gideon—to the acquisition of long keeping kinds of the apple of equal beauty and quality, and other species of choice fruits common to northern climates in the older settled parts of the world.

But to obtain valuable seedlings, it is necessary to procure good, plump, healthy seeds from good fruit of vigorous and hardy trees of northern growth. These seeds must be carefully selected, from both Russia and the northeastern regions of this country, as the chief sources of our supply; and from our home grown trees, grafted and seedling.

The apple seeds sold by the seed merchants should be universally condemned as worthless. These seeds are almost all obtained by washing them out of the pomace of the cider presses of the Atlantic States, where the diseased and unmarketable apples are refused and cast aside for the manufacture of cider. Such seeds are utterly worthless for seedling culture, and wholly unfit for root grafting. Minnesota should not follow the example of the old commercial nurseries, whose apple roots for grafting are grown from the seed of the cider presses, the consequence of which is the cause of general complaint of increasing failures of apple tree growing for profit, in the old apple growing states.

A few other suggestions in regard to the improvement of fruit trees by progressive seedling culture, may be briefly stated to close this subject for the present, although many other kindred topics present themselves.

1st. Fruit tree culture by seedling selections, in even this age of horticultural acquisitions from the remote past, rarely attains, in any region or climate, the highest degree of improvement from the continued grafting upon roots or stocks, from the first generation of seedling scions. Progressive improvements may be continued, as I am convinced by facts fully authenticated, by successive selections for at least two or three generations.

2nd. As a general practical rule, the best variety of fruit of every climate is produced only in the region where its parent stock first originated.

3d. *Illustrative.* The best apple of America and of the whole world is the Newtown Pippin, but it is best only in the region of country where it originated from a seedling tree. The Seckle—the

best pear in the whole world—best, although quite small, is best only in the region of country where it originated.

4th. Every kind of standard fruit always changes more or less in characteristics and almost universally deteriorates in quality when far removed from the region where it originated. Selected seedlings from such varieties may and generally do produce excellent kinds of fruit, where the fruit of the ancestral tree was worthless.

Illustrative Examples: The best varieties of apples now grown in our southern states originated from the seedlings of grafted trees from more northern states, which were first planted in the south, and produced there very inferior fruit. The best varieties of apples of the eastern states, where the trees or graftings thereof are grown in the northern states, produce in the western states fruit of the same names, but they are greatly deteriorated in quality. The best varieties of standard fruits in Europe become more or less denaturalized when removed to any part of America.

These brief remarks on *the improvement of fruit trees by seedling culture* are submitted to the enlightened judgment of the practical horticulturalists of this society. I will be greatly obliged to any of them for any criticisms or suggestions they may be pleased to communicate on this important subject.

A LADY'S SUGGESTIONS ON HORTICULTURE ON MINNESOTA PRAIRIES.

LINDEN FARM, LAKE CRYSTAL, March, 1884.

Oliver Gibbs, Jr.

DEAR SIR:—Please accept my thanks for a copy of the "State Horticultural Society's Report." I find it replete with interest and teeming with animation that speaks well for the society's future success.

It has been considered a doubtful question with the prairie farmers of Minnesota whether fruit growing can be made a success, but I am happy to say it is gradually being overcome. I do not think any prairie farm need be without its supply of fruit if the farmers will but take the pains to put out groves and hedges for protection against cold winds and storms.

We have around our garden as well as around many of our fields

white willow hedges, and I find we are able to gather vegetables from our garden earlier in the spring than almost any one else in the vicinity, besides being protected much later in the fall from frosts. Last fall my tomato vines were green and loaded with ripening fruit when almost everybody else's was killed with frost.

I am sorry to say, there is too much of a disposition with the farming class to devote their entire time and energy to the care of their fields and stock.

The orchard, the garden and the yard are considered weak-minded topics, fit only for the consideration and devotion of women. I know farmers who will not spend a day's time in helping to arrange the garden, but if the poor, weary housewife, by dint of perseverance on her own part, and perhaps with the help of the children, succeeds in spading up a small piece of ground and raising a few vegetables, and when the hard-earned delicacies that should be relished only by those who have struggled for them, are at last brought upon the table, the "liege lord" will be first to help himself, without even giving a passing thought as to how they came.

I have often thought that instead of simply an apple sticking in man's throat, it is only a mystery how he has escaped the lodgment in the same region of a whole cabinet of specimens of the domestic fruit and vegetable kingdom.

Again I have seen men, women and children go three or four miles to gather little stunted wild strawberries.

To be sure, their flavor is nice enough, but they are so small, and the same amount of time spent in going for them and cleaning them would set out a bed of beautiful Bidwells, Manchesters or Captain Jacks in one corner of their garden at home, that would only require a small amount of attention and would always be handy to gather at their convenience. Three years ago we set out a bed of strawberries in our garden, simply for family use. We kept them weeded out that summer, and in the fall we put on a light mulch of chaff, and the next spring I was astonished to find with a family of nine or ten using all we could possibly get away with without foundering, that at the end of the season we had sold \$25 worth. The following spring proved to be a very unfavorable season; however, aside from all we needed for family use, we again sold fifteen dollars' worth, making in all forty dollars' profit from this little bed. The same spring I set out a new bed and last spring we got some very nice berries from it. Last fall I potted some Bidwells and Manchesters and set them out. The weather proved so dry

and unfavorable that I am waiting anxiously for spring to see the results. No one can realize the loss of these little delicacies until they have once had them in abundance.

We have been feasting all winter on our stock of canned plums, raspberries, currants, jams and jellies, and I would say for the benefit of lovers of raspberry short-cake that it is quite as delicious made of canned raspberries in dead of winter as in their prime season.

Another point, farmers are too apt to be negligent in the care of the grounds surrounding their buildings. Now, of all places, I think the farmer's home should be made comfortable and attractive. I do not mean expensive buildings and adornments, but simply comfortably well arranged buildings and neatly kept yards and lawns. It does not take very long to get the yard seeded in blue grass, and set out some evergreens, hard-maples, box elders, rock elms and cottonwoods, promiscuously or in groups that will render your home beautiful and attractive.

I have been so situated that I have not had much time to spend in out-door flower culture, but I always have quite a collection of greenhouse plants, and as early in spring as the weather will permit, I take the storm sash and enclose the porch exposed to the east, which is some 18 or 20 feet long, and arrange my plants there for the summer. I train my vines over the weather-boarding and hang from the ceiling a variety of baskets here and there. I arrange my pots on shelves and stands to the best advantage with reference to light. After this is done they require very little attention, further than to give them a refreshing shower bath every morning with the sprinkler, and I must say I have never seen handsomer plants in a greenhouse or elsewhere. Last summer I had one geranium that had thirteen clusters on at one time.

I hope I may not be considered presumptuous in offering the above suggestions. I have seen so many country homes so perfectly barren of trees, fruits and flowers, that the cheerless aspect made my very heart ache. I do not think we have more than half fulfilled our mission here on earth unless we have tried to make our paths those of pleasantness and our homes a haven of rest.

MRS. S. E. CURRYER.

SMALL FRUITS AT SHAWANO.

SHAWANO, WIS., Aug. 3, 1883.

We have good success in small fruits, most of them growing indigenous to the soil, and some, I think, that you do not produce—especially the Blueberry, which is a distinction from the Huckleberry or Whortleberry and far superior, although nearly resembling it in appearance and size. They afford quite a revenue to the Indians on the Menominee Reservation, who alone engage in gathering them, and one day this week they marketed over 800 bushels. First with us, of wild fruits, comes the Strawberry, the Blueberry, Raspberry, Huckleberry, Blackberry, and Cranberry late in fall. I am safe in saying that in a good Blackberry season, there are not less than fifteen thousand bushels that are left unpicked up the river from here, within 25 miles, for the lack of market in which they can be profitably handled, as we are isolated from railroad connections, and they will not so well stand carting over rough wagon roads as some other fruits.

When our projected "St. Paul and Eastern Grand Trunk R. R." is completed through this county, we shall be able to give Minnesota a taste of our surplus good things, fruit-wise.

W. S. WOOD.

FERTILIZING *vs.* POLLENIZING.

We need a new word in horticulture, or else an agreement as to the use of an old one. Here is one Professor publishing a paper to illustrate the influence of particular manures on certain crops, and he calls it "fertilization." Then we have the phrase "commercial fertilizers." All right according to the dictionary. But here comes another Professor to tell us about the sexual characters of plants, cross-breeding, hybridization, etc., and when he comes to speak of the agency of the pollen of flowers, he gives us "fertilize" and "fertilization" to mean something entirely different. Why not say *Pollenize*, or *Pollenization*, and have a bye-law to that effect, and leave the other word to apply exclusively to the enrichment of the soil? Either this or a new word. This is referred

to the American Pomological Society, the American Association for the Advancement of Science, and the American Association of Nurserymen, Seedsmen, and Florists. Let us have a law on the subject—and vote any man a bore who violates it. G

THE CAUSE AND PREVENTION OF DEVASTATING FLOODS.

There can be but little doubt but the yearly increasing floods in the Ohio river are rendered more frequent and severe from the fact that all its main branches have been, to a great extent, stripped of the forests through which they formerly flowed. The Alleghany, the Kanawhas, the Big Sandy, all these have had their forests stripped away and the soil can no longer retain the rain and water formed by the dissolving snow, and the immense amount of water falling upon this great area of country slides down the steep hill sides and into the river channels at once. As the tributaries meet and join each other the task to hold and bear them onward is more than the Ohio can bear and its banks are overflowed, and wide spread damage and disaster must follow. It is a well understood fact that forests protect the country adjacent to them from destructive floods, and also from severe droughs. In Europe this is so well understood that for many years past the governments of Germany, Austria, and Italy have been spending immense sums of money in planting millions of trees on waste lands on the head waters of the rivers, and are restricting by severe means the destruction of the remaining forests. The time has fully come when something of the kind should be done in the United States.—JOHN N. MURDOCK, in *Wabasha Herald*, February 24.

FRUIT TREES IN LYON COUNTY.

In the last ten years I have set upwards of 300 apple trees in Lyon county, and not one has died from climatic causes.

MARSHALL, Sept. 17, 1883.

J. W. BLAKE.

AMENDED CONSTITUTION AND BY-LAWS OF
THE MINNESOTA STATE HORTICUL-
TURAL SOCIETY, AS PROPOSED
AT THE ANNUAL MEET-
ING, JANUARY, 1884.

ARTICLE 1. This society shall be called the Minnesota State Horticultural Society, and shall have perpetual succession.

ART. 2. The object of the society shall be to improve the condition of horticulture and arboriculture by collecting and disseminating correct information concerning the culture of such fruits, flowers and trees, and other productions in horticulture, as are adapted to the soil and climate of Minnesota.

ART. 3. The officers of this association shall consist of a president, one vice-president, a secretary and treasurer, and as many directors as there are congressional districts in the state, who, together, shall form a board for the general management of the affairs of the society; provided, however, that the control of all affairs of the society shall remain in the hands of the members at any meeting thereof, to be resumed and exercised by the board only *ad interim*. The officers shall be elected annually by ballot at the annual meeting. Said board or the society at any regular meeting may adopt such by-laws as may be deemed necessary for the society and not inconsistent with the constitution and the laws of the state of Minnesota, and may change the same from time to time at any such meeting.

ART. 4. The president, or, in his absence, the vice-president, or, in the absence of the latter, any member of the board who may be selected as acting president, shall preside at all meetings of the board or the society, and the presiding officer shall be for the time being the chief executive officer of the society, and authorized to sign all vouchers relating to the business of such meeting.

ART. 5. The secretary shall keep an accurate and full record of the proceedings of the society. He shall carry on correspondence with such fruit growers, florists and horticulturists in general as manifest an interest in the purposes of the society. He shall be ex-officio delegate to the American Pomological Society, to State horticultural societies of states adjoining Minnesota, and to the

Mississippi Valley Horticultural Society, with such other delegates as may be appointed.

He shall search with reasonable diligence for new and useful sorts of fruits, plants and trees, obtain them as far as practical for exhibition at meetings of the society, and collect and distribute for trial and propagation cions, seeds and plants, under such regulations as the board or the society shall make. He shall incur no expenditure of a large or doubtful character, except with the sanction of the board or the society. He shall compile and edit the annual report of the society, and shall attend to its publication and distribution; and for his services he shall be allowed a reasonable compensation.

ART. 6. The Treasurer shall have charge of the funds of the Society, and pay them out only upon the order of the Board or the Society upon vouchers signed by the President or acting President and the Secretary. He shall make up a full and true report of all receipts and disbursements of the Society, and present the same to the Secretary on or before the tenth day of January, in each year, or at any other time when called upon to do so by the Board or the Society. His annual report shall begin and close with the calendar year. He shall give bond in such sum as the Board or the Society may direct, to be approved by the President or Acting President, and the Secretary, and said bond when so approved shall be filed with the State Auditor, and it shall be renewed yearly for each term of office. A copy of the bond shall be filed with the Secretary of the Society.

ART. 7. The Members of the Society or of the Board present at any meeting thereof shall be a quorum for the transaction of business.

ART. 8. Any person may become an annual member of this society, on payment of the sum of one dollar, or a life member, on payment of ten dollars, and all membership fees shall be first paid to the Secretary, and by him be immediately paid into the hands of the treasurer.

ART. 9. Honorary members for a time stated or for life, may be elected at any meeting by a two-thirds vote of the Society, and they shall be entitled to all the rights and privileges of membership, except voting for officers; but this shall not be construed to prevent any person from joining the active list by paying the membership fees.

ART. 10. The fiscal year shall commence January 1st, and end December 31st.

ART. 11. This Constitution may be amended at any annual meeting by a vote of two-thirds of the members present, provided that notice of proposed amendments shall be presented and lay over one day before a vote on the adoption.

BY-LAWS AS PROPOSED AT THE ANNUAL MEETING, JANUARY, 1884.

1st. The terms of all officers of the society shall be one year and until their successors shall be elected and qualified; except a retiring secretary, who shall hold his office till the 1st day of July, after the election of his successor, in order that he may officially prepare and superintend the publication of the annual report for that year.

2d. Meetings of the board may be called at any time by the President or Acting President and Secretary, and it shall be their duty to call such meetings whenever requested to do so by a majority of the board.

3d. The annual membership for the previous year shall cease on the first day of the annual meeting, and before the election of officers.

4th. No person who has not been actively identified with the Society for three years at some time during the period of its existence shall be eligible to the office of President, Vice-President or Secretary.

The foregoing draught for an amended Constitution and By-Laws was referred to the following committee, to report at next meeting: J. M. Underwood, R. J. Mendenhall, Wyman Elliot, A. W. Sias and G. W. Fuller.

COLONEL ROBERTSON AND DOCTOR WARDER—
A COINCIDENCE.

Forty-two years ago, Col. D. A. Robertson was the editor of the *Elevator*, a weekly journal published at Cincinnati, devoted to agriculture, science, political and social economy; and in the eighteenth number, issued March 19th, 1842, he introduced Dr. John A. War-

der to the world as a writer on scientific subjects. The following is the paragraph in which the introduction was given:

PROFESSOR WARDER.

"We are happy to be able to announce to our readers, that Professor Warder, of Cincinnati College, has kindly consented to become a contributor to the scientific department of the *Elevator*. Several communications from the Doctor will be found on the first page of the present number. The well known abilities and acquirements of Professor Warder amply qualify him for the office of an instructor. Though a professional gentleman, he feels deeply concerned in the elevation of the masses. 'The Ice Period of the World' is an intensely interesting article. The Doctor's aid will greatly enhance the value of this journal."

In a note to the Secretary, inclosing several copies of the *Elevator* of 1842, Col. Robertson says:

"Dr. Warder was the Professor in the Medical College of Cincinnati, and became afterwards proficient in horticulture. We traveled over nearly the same track in various studies. A coincidence: That we should, after so many years, gain like honors from the Minnesota Horticultural Society."

The readers of our report will be glad to observe that the Colonel has lost none of his old time interest in topics of popular education—his mission still being that of an elevator of his race—and that his pen retains its facility, vigor and grace of expression.

We are promised for our next annual meeting a paper or lecture from him, giving the gathered treasures of his scientific studies in horticulture, winnowed by the best judgment of his riper years.

CIONS DISTRIBUTED TO EXPERIMENTAL STATIONS MARCH 29, 1884.

NAME AND RESIDENCE.								
	Ostheim Cherry.	Red Plum	Green Plum	Rimbacker Apple	German Rambo Apple	Robinson Seedling.	Whetstone Apple.	Bel Wright's Wint. Sweet.
Prof. E. D. Porter, Minneapolis.....	5	4	3	4	4	4	5	4
Peter M. Gideon, Excelsior.....	5	4	3	4	4	4		4
Underwood & Emery, Lake City.....	5			4	4			
L. E. Day, Farmington.....	5			4				
Barnett Taylor, Forestville.....	5		3					4
E. H. S. Dartt, Owatonna.....	5		3	4	4			4
J. S. Harris, La Crescent.....	5	4	3		4			
A. W. Sias, Rochester.....	5	4		4	4	4		4
G. W. Fuller, Litchfield.....	5	4		4	4	4		4
O. M. Lord, Minnesota City.....			3					
M. Pearce, Northome.....		4		4	4			
Total.....	45	24	18	32	28	28	5	24

All the foregoing, except the Wright apples are the contributions of Charles Ludluff, of Carver, delivered to the Secretary at the annual meeting in January.

The cions of the Wright apples, are the contributions of the grower, James Wright, of Minnesota City, cut by the secretary in February. These cions are sent out for trial, and for redistribution through the State Horticultural Society, of such as prove to be adapted to their new locations.

For a description of these varieties, see report of Charles Ludluff on fruits grown in Carver county, page 203 of this volume, and the seedling fruit report of J. S. Harris, page 359; and for a list of experimental stations with names of superintendents, in full, see page 256.

CHESTNUT GROWING NORTH OF 44°.

At the Green Bay meeting of the Wisconsin Horticultural Society, December 20, 1883, mention was made regarding a lot of seedling chestnut trees that were growing successfully in Waupaca

county, nearly as far north as latitude 45° , and on my return I succeeded, with the aid of postmaster A. L. Hutchinson, at Weyauwega, in that county, in finding the address of the grower, Mr. Bennett, who furnished the following particulars about the trees :

The seed was obtained from Groton, Mass., and planted in the year 1858. The next year the young trees were transplanted to fence corners. There are ten of them growing on Mr. Bennett's place, all in good condition, and being now 26 years old. The soil is sandy, with gravelly clay subsoil. Temperature fell, at Weyauwega, last winter as low as 40° below zero. Accompanying the following letter from Mr. Bennett were samples of sound wood cut from the trees above mentioned.

LETTER FROM MR. BENNETT.

Weyauwega, Wis., Jan. 9, 1884.

Oliver Gibbs, Jr.

DEAR SIR:—A reply to all of your questions would take more time than I have at present. However, I would like to say a few words.

My experience in growing chestnuts would be to get your seeds as far north as they will be mature before the frost opens the burs. Keep them moist till the following spring, but do not let them mould. Plant in drills, cover about two inches deep, make as much growth the first year as possible. Mulch the ground around the roots, winters, till some of the roots have gone below the frost line. When they do not make a good growth the first year, take them up in the fall, heel them in the cellar, and set out in the spring.

I have never lost any Chestnut trees by frost or cold winters.

My trees are 25 to 35 feet high. They are 10 to 15 inches in diameter, and bear well. I have no trees to sell.

ALVIN S. BENNETT.

P. S. I have some seedling apple trees that stand our 40° below zero, and the fruit is good.*

* Mr. Bennett's seedling apple orchard is described by Mr. Springer in his report on the Waupaca Seedlings. See page 196.

HENNEPIN COUNTY HORTICULTURAL SOCIETY.

This Society was organized February 16, 1884, and meets the last Saturday in each month at two o'clock p. m., at the Market House, Minneapolis.

OFFICERS :

<i>President</i>	M. PEARCE, Minneapolis.
<i>Vice-President</i>	C. L. SMITH, Minneapolis.
<i>Secretary</i>	WM. H. BRIMHALL, St. Paul.
<i>Treasurer</i>	HENRY F. BUSSEE, Minneapolis.

EXECUTIVE COMMITTEE :

The foregoing officers and

J. S. Gray, Minneapolis; Geo. S. Woolsey, Minneapolis; E. M. Chandler, Minneapolis; Wm. Lyons, Minneapolis; G. H. Roberts, Minneapolis.

Membership is open to all persons interested in horticulture, and visitors are cordially welcomed.

Up to this date the following papers have been read and the subjects treated therein discussed at the meetings:

"Trees, Seeds and Plants and their Adaptations to Soils," by M. Pearce; "Strawberry Culture," by William Lyon, "Shade and Ornamental Trees," and "Fertilization of Strawberry Blossoms," by C. L. Smith; "Currants," by J. T. Grimes, and "Raspberries," by M. Pearce.

The meetings are well attended and are growing in interest.

WM. H. BRIMHALL.

Minneapolis, March 28, 1884.

REPORT OF THE DELEGATE TO THE IOWA HORTICULTURAL SOCIETY.

Mr. President and Members:

I have again been privileged to attend the annual meeting of the Iowa State Horticultural Society. The meeting was well attended by substantial representative men of one of the best and most progressive states in the Union.

Delegates were in attendance from Wisconsin, Illinois and Kansas, to whom were extended the usual courtesies.

The last year has been a very disastrous one to the fruit interests of Iowa. The reports of directors from all parts, except the southwestern portion, show a very light crop of fruit of nearly all kinds, varying usually from half a crop to a total failure. These valuable reports also show widespread destruction of trees in orchard; twenty-five to thirty per cent, of all orchard trees being killed outright or virtually ruined. It may be regarded as a singular fact that this destruction was greatest in the southeastern part of the state, where the mercury went to about forty below, and seventy-five per cent. of trees are reported ruined, some entire orchards being destroyed on low lands, whilst on high lands the injury was proportionally less according to altitude. The greater destruction in this section is undoubtedly due to the fact that further north more attention has been paid to the selection of hardy varieties. Nursery stock and young orchards have suffered but little, whilst orchards ten to fifteen years out are injured worse than older trees.

The variety that has suffered worst of all is Ben Davis. Some will replant this variety on account of its good record in the past, whilst others will discard it entirely.

In the southwestern portion of the state, but little injury was done. A few trees were killed, the number increasing towards the north. The fruit crop in this section was generally good.

There seems to be quite a difference of opinion as to the cause of this general destruction of trees. Some believe it is not the extreme cold that kills, but the sudden changes towards spring. Others think the condition of the soil as to moisture at the setting in of winter has an important bearing, abundance of moisture being a favorable condition. All agree that hardier trees are a necessity, and that to obtain long keepers of the best quality, extensive experiments must be carried on. And in view of this fact they voted to ask for an annual appropriation of \$2,500, in addition to the \$1,000 they now receive, believing that a state rich enough to build a two million dollar capitol, can well afford to devote this small sum to promote so important and valuable a branch of industry.

The President's address was brimfull of good practical suggestions and the lectures and essays were mostly admirable productions in plain English, there being scarcely a reminder that the authors knew a little Latin and desired to make the most of it.

It occurs to me that in sending delegates to adjoining states where climates are less rigorous than ours, our greatest benefits must accrue from adopting such of their methods as are superior to our own and avoiding such as retard. In my last report I mentioned Iowa's plan of districting the state and electing a director for each district. My observation at this meeting confirms me in the opinion that with the combining of the reports of two or three of their twelve directors in one to save repetition as recommended by their President in his address. We may adopt this plan with great advantage to our state. The programme seemed remarkably full, requiring the constant effort of their able and energetic President to put things through on time.

* * * * *

E. H. S. DARTT.

[Other portions of this report are reserved for the action of the society.—
SECRETARY.]

RUSSIAN APPLES.

As pioneer fruits for the cold northwest, I prefer the Russians to the crabs or hybrids. 1st. They average larger. 2d. They are less subject to blight. 3rd. They are generally better in quality. 4th. Are better stocks to graft the common apple on. 5th. Will sell much higher on the market. I propose to hold fast to the Russians till we originate something more profitable from seed. We fruited forty varieties the past season, among them four or five of the Anis family, as hardy as our native oaks.

Revel Pear apple, Red Transparent, Russian Green, White Pigeon, Leipzig, Borsdorf and many others are very fine in quality and extremely hardy.

Wm. Forster, of our county, showed us four White Astrachan trees that look promising; they said the crop the past season was about sixteen bushels, which was a good showing for trees of their size. This variety is said to be of Russian origin and imported into England from Sweden in 1816, with the Red Astrachan. I am unable to say why it has not been cultivated more; it appears to be more hardy and a better bearer than the Red Astrachan. Mr. Cottrell, of Dover, speaks well of the Round White, and White Pigeon. For top working with winter varieties of the common apple, I would suppose the Red and Yellow Anis would be superior to most anything else, owing to their extreme hardness.

Sidney Corp, of Wabasha county, has the Yellow Anis in bearing, and speaks well of it. We can market many of the Russian apples before the middle of August; this enabled me the past season to put up enough previous to the great gale of August 21st, to take the sweepstakes premium at our fair. A. W. SIAS.

COL. ROBERTSON'S ESSAY OF 1867.

[The Minnesota Horticultural Report of 1873 being nearly out of print, the essay of Col. Robertson referred to in previous pages is herewith republished in compliance with numerous requests from members of the society.]

CLIMATOLOGY IN ITS RELATIONS TO FRUIT GROWING.

An essay read at a special meeting of the Minnesota Fruit Growers Association, St. Paul, January, 10, 1867, by Col. D. A. Robertson, of St. Paul.

The object of the Minnesota Fruit Growers' Association is to promote in Minnesota the profitable cultivation of valuable fruits, varieties of which have already become naturalized to the more southern latitudes of our country.

The importance of this enterprise is made apparent by the fact that more fruit is consumed by the American people than by the inhabitants of any other temperate climate. The consumption and demand increase faster than the supply. The popular taste is rapidly improving. The fondness for fruit growing is becoming a characteristic of our people, who are not content to make a permanent home where the choice fruits of the North cannot be grown.

The attempts, hitherto made in our state to raise apples, pears and plums have, we must acknowledge, resulted in almost universal failure. Few trees of these fruits have survived the third year after planting—probably not more than one in three hundred—perhaps not more than one in five hundred. Mr. Stewart's success in raising seedling apple trees may be taken as an average, one tree in ten thousand of his seedlings survived to maturity.

It is not surprising, therefore, that an opinion generally prevails, that Minnesota is too far north for the successful cultivation of apples, pears, cherries and improved varieties of plums.

It is consequently of the first importance that we should ascertain whether or not, we are within the zone or limits to which the cultivation of these fruits is confined.

That we are in the zone of the fruits named, facts, I think, demonstrate. Our failures have been doubtless owing to want of experience in cultivation, to want of proper adaptation, and to lack of knowledge in selecting varieties.

The essential conditions of temperature to insure success, are a sufficiency of heat in the growing season to ripen the fruit and of subsequent cold to force hibernation—or compel the tree to stop growing without killing it. Our summer heat is sufficient; our winter cold too intense, for most of the varieties we have tried.

I venture the proposition that in any climate where the summer heat is sufficient to ripen the fruit of any given kind, that there are varieties of trees of such fruit, *or new varieties may be originated*, which will withstand the winters and seasonal extremes of temperature in such climate.

The fruits named have been carried by civilized man in his migrations from milder climates northward. The change in the constitution of the tree has been gradual. *Naturalization from mild to much colder regions has been accomplished by the production of new varieties*, the essential characteristics of which have been earlier ripening of the fruit, and greater hardiness of the tree to enable it to endure severer cold or greater differences of seasonal temperatures.

It is a mistake to suppose that trees adapted to a southern climate and requiring a long growing season, can ever be acclimated to one much shorter.

As a general rule applicable to our continent, every additional degree northward shortens the growing season about four days. Our season at St. Paul is therefore twenty days shorter than that of Philadelphia.

Some varieties of fruit which ripen at Philadelphia must fail here in consequence of our shorter growing season.

But length of growing season is not the only condition—every variety of vegetation requires for its maturity of leaf or fruit a certain sum of heat. Wheat, for example, requires, according to the observations of Boussingault, from 2,000 to 2,200 degrees of heat, centigrade, which, with a mean temperature of 20 degrees centigrade, would require from 100 to 110 days to ripen.

But, in ascertaining the requisite quantity for plants growing exposed to the sun, the thermometer consulted should also be

exposed to its rays. This is the approved method of observation, which, when applied in our climate, will, I think, give results highly favorable—showing that the solar heat of our growing season is sufficient to mature all early varieties, not only of the fruits named, but of peaches, also.

Our mean summer temperature is greater than that of Paris, in the vicinity of which all the fruits named are cultivated with great success.

The obstacle to our success in fruit growing, thus far, therefore, is our Russian winter climate.

The fruits I have named are cultivated with success in Russia. Pallas, who visited Moscow, near the close of the last century, states that these fruits were then cultivated in that vicinity, "and sold at reasonable prices."

Mentelle & Maltebrun, in their great work published in Paris, in 1803, give an account of the fruits cultivated in Russia, embracing apples, pears, cherries and plums. A variety of apples grown at Kervsk, they describe as weighing four pounds, of a delicious flavor, and keeping a long time. Another variety of apples grown in the vicinity of Moscow, which was brought from China, they describe as so transparent that when held up to the light, one can count the seeds in it. They state that in several of the districts of Russia, the exportation of fruits, and especially of apples, is an extensive branch of commerce—that the exportation of apples from the towns of Kalouga and Simbirsk, amounts to from 18,000 to 20,000 roubles annually; and that in some parts of Russia, the cultivation of the cherry for the manufacture of *Kirschwasser*, is carried on very extensively.

On the Volga and on the steppes of the Caspian, all the fruits I have named, including varieties of the peach, are profitably cultivated.

Xavier Hommaire de Hell, in his travels over the steppes of the Caspian, in 1838, describes a splendid fruit garden, owned by a Russian noble, at Clereofka, where he says "all kinds of fruits are collected here together. We counted more than fifty varieties of pears in one alley."

Adolph Erman in his travels through Russia and Siberia in 1840 mentions with surprise that he found at Torxhok, on the road from Moscow to Saint Petersburg, north of latitude 57 deg., and at Vladimir, north of 56 deg., that "cherries of a superior kind" were extensively grown and sold at a very low price.

There are also extensive orchards of apples at Vladimir, which is famed in Russia as a fruit region.

There are other continental or interior localities much further south of the places named, where from climatic conditions, the winters are intensely cold, and the summers dry and hot, from which we may procure varieties of fruit trees adapted to our climate. Of these I may mention Astrachan, and Russian Armenia, in which Erivan is the most celebrated for its numerous and extensive orchards and vineyards. The summers are hot, and I judge much like our own, but the winters so cold that it is necessary to cover the grape vines with earth to preserve them. My information on this subject is derived from the voluminous work of Montpéreux, who visited that region in 1838. He states that there are there 1,470 gardens planted in vines, apple and pear trees, the sale of the fruit of which constitutes the principal revenue of the place. The same author mentions other places in the Caucasus mountain range between the Black Sea and the Caspian, where the fruits named are extensively cultivated, and where some varieties of wild grapes are equal to the cultivated varieties of France.

In Dr. Clark's Travels in Norway and Sweden, published in 1838, there is frequent reference to the excellent apples, pears and cherries found by the author growing in those countries.

He was much surprised and delighted with the horticultural improvements at Trondhjem in Norway, 63 deg. 25 min. north. He says, speaking of the town: "The houses are handsome, regular, large and airy, with pleasant gardens full of fruit and flowers, worthy of note in such a northern latitude, apples, pears, plums, cherries, strawberries," etc.

Surely these facts ought to encourage us to persevere in our efforts to obtain varieties of standard fruits adapted to our climate.

We must, I think, for entire success in our day and generation, procure by some means, for naturalization in Minnesota, varieties which thrive in the cold countries referred to, and especially from the continental or interior parts of Russia and Northern China, where the climate is like ours, not only intensely cold in winter, but also dry, as compared with maritime or lake coasts, and hot in summer, and the growing seasons of which are short like ours.

Apples are successfully cultivated in climates where the winters are far more severe than ours. Sir George Simpson, the late Governor of Hudson Bay Territories, gives in his Voyage Round the World. an account of his visit to Burnaul, Siberia, which is

north of the Little Altai mountains, and of Northern China. He states as a fact that apples are cultivated there.

I have seen it stated that the Duchess of Oldenberg is of Siberian origin, from which country it was introduced into Russia. We have already ascertained that the Russians trace the origin of some of the varieties of apples they cultivate to China; and some of the travelers from whom I have quoted, state that the variety of apples they saw in Russia are unknown to other parts of Europe.

The Russians have maintained for more than one hundred and fifty years overland commercial intercourse with Northern China, which extends to the 50th parallel; and as the Chinese are the most skillful horticulturists in Asia, and probably the most ancient in the world, we may reasonably conjecture that many varieties of fruits growing in Russia were derived from Northern China, a portion of the globe about which very little is known, but which I have no doubt affords a magnificent field for horticultural exploration.

I have been able to find but one author, Pere du Halde, who gives an account of Northern China. Du Halde says the same kinds of fruits are raised there as in Europe, and particularly mentions apples and pears. This is in Manchooria, from which came the present ruling race of China, a race of very ancient civilization. The climate of Manchooria, is as hyperborean as that of Minnesota, and we may reasonably seek in that country for valuable varieties of fruits that could be successfully naturalized to our soil.

I think that our experience thus far shows that, as a general rule, the varieties of fruits best adapted to our climate must be obtained from the interior of continents where the climate is similar to our own.

We have been disappointed in our efforts to naturalize apple trees which grow in the Canadas even north of Quebec, and in Maine.

There has been, it is true, some success in varieties from those regions, but in fact, general failure. Success with them depends upon highly favorable circumstances, and the best methods of culture and protection.

For general success we need other varieties, which, like the Duchess of Oldenburg, are as hardy as our native forest trees.

We cannot be content to await the production of valuable new varieties, which may not be possible in a life time.

Our naturalized Duchess of Oldenberg is a fall apple, lasting but

a short time. What an acquisition would we have in the Russian four-pounder, grown at Kirvsk, which is a winter apple, a great keeper and of superior quality. Its introduction would be worth millions to our Russian north.

Thomas Jefferson said that the person who introduced the Catawba grape conferred a greater benefit upon the country than if he had paid off the then national debt, which was considered vast.

How shall we estimate the value of the benefaction bestowed upon our people by the enterprising pioneers who shall succeed in introducing into general cultivation in Minnesota, varieties of valuable standard fruits, such as apples, pears, cherries and plums, which may be profitably grown for exportation as well as for home consumption. This is surely an object of great public importance. I believe that, however improbable it may appear, its accomplishment is possible, in our day and generation.

Is there not to be found somewhere in the North, at least one lover of horticulture, who has the necessary knowledge and the will to go and collect from the countries referred to, varieties of fruit trees for adoption here, and who has also what is essential—money enough to pay his way? Such a man who will thus devote himself to the public good, will confer incalculable benefits on our state, and entitle himself to the rank of a public benefactor.

[Editorial comments on the foregoing essay from the St. Paul Press, of January 11th, 1867.]

In our report of the proceedings of the Fruit Growers' meeting held last evening at the Court House, will be found an admirable paper, prepared by Col. D. A. Robertson, embracing in brief some of the results of the laborious researches of that gentleman, in what may be called the climatology of fruit culture, as applicable to the naturalization of apples, pears, cherries, and other staple fruits of the temperate zone in this climate. As a matter of fact it has been ascertained by costly experiment, that most varieties of fruit trees will not survive the winter climate of Minnesota, while some few of northern origin, such as the Duchess of Oldenberg, successfully resist the rigors of our winters. It is also a matter of fact, that in climates whose winters are as cold as ours, apples, etc., thrive well, but the experiment of introducing these hardy varieties from Lower Canada, northern Vermont or Maine, has also generally proved a failure.

But these failures have not disheartened Col. Robertson, who has an abiding faith that the apple may, in time, be educated to our climate, and that, in the meantime, there are many existing varieties, besides those already introduced, which are entirely adapted to our climate.

He assumes that these varieties may be found in analagous climates. This principle has been generally recognized by intelligent horticulturists, their only error being in regarding those climates as analagous where the winter temperatures, or, still more loosely, where lines of latitude correspond. But atmospheric moisture is almost as important an element of climate as temperature, and this principle of climatology has been very generally overlooked by our fruit growers.

Guyot divides climates generally into two classes, the maritime or oceanic, which cover the seaward slopes of continents with the humid atmosphere of the sea, and the interior or continental climates, where a dry atmosphere prevails, such as reigns over the interior plains of Asia and America.

Now, the climate of Minnesota is a blending of these two in summer; while in winter the arid interior atmosphere generally prevails. It is in a corresponding geographical situation in the Eastern Hemisphere, that we must seek for the climatic parallel of Minnesota, both as to heat and moisture. We long ago pointed out the striking coincidence both of temperatures and rain measures between the climate of Minnesota and Central Russia, and it is here that Col. Robertson is led by his researches in natural history to look for the apples, pears, plums, and cherries which are suited to the peculiar conditions of our Minnesota climate. The subject is one of such great importance as will justify practical investigation. For our own part, we do not in the least doubt that Col. Robertson has got upon the right track, and that not in Illinois nor even in Northern New York, nor in Lower Canada, but in the interior of Russia and Siberia, are to be found the nurseries which will supply our fruit growers with the future orchards of Minnesota.

EXPLANATORY.

Under advice from members of the Executive Committee the Secretary had solicited and obtained from the authors several excellent papers on general agriculture, read at the meetings of other societies during the past winter; but, it having been intimated that their publication in the Horticultural Report might be open to question by the Legislature as being unauthorized by law, it has been decided reluctantly to leave them out, and to limit the report strictly to matters of horticulture and forestry.

Among these papers, the following were and are believed to be of much value to Minnesota farmers:

"Minnesota as a Dairy State," by O. C. Gregg, of Camden, Lyon county; "Practical Truths by a Farmer's Wife," by Mrs. S. E. Curryer, of Lake Crystal, Blue Earth county; "Brains in the Dairy," by L. B. Hibbard of the *Farmer's Review*, Chicago—read at the Mankato meeting of the Northwestern Dairymen's Association; and "Wind as a Farm Motor," by C. D. Fox," of Beloit, Wisconsin—read at the February meeting of the Wisconsin State Agricultural Society.

Reports of the two societies mentioned, containing these papers, will be solicited in exchange, for the benefit of members of the Horticultural Society who may wish to read them.

*THE LAW RELATING TO THE PRINTING AND
DISTRIBUTION OF THE HORTICULTURAL
REPORTS.*

CHAPTER 8, GENERAL LAWS OF 1883.

AN ACT TO AMEND CHAPTER SEVENTY-TWO (72) OF THE GENERAL LAWS OF ONE THOUSAND EIGHT HUNDRED AND EIGHTY-ONE (1881,) RELATING TO THE STATE HORTICULTURAL SOCIETY.

Be it enacted by the Legislature of the State of Minnesota:

SECTION. 1. Sections one (1) and two (2) of chapter seventy-two of the general laws of eighteen hundred and eighty-one (1881) relating to the state horticultural society shall be amended so as to read as follows:

SEC. 1. There shall be annually printed and bound thirty-five hundred (3,500) copies of the annual report of the state horticultural society, provided the number of printed pages of the same shall not exceed five hundred (500); which report shall be transmitted to the Governor, and shall be distributed by the state horticultural society, as follows:

One (1) copy to each of the state officers, members of the legislature, judges and clerks of the supreme and district courts, county auditors and members of the board of regents and faculty of the State University; fifty (50) copies to the state historical society; one hundred (100) copies to the state board of immigration; one hundred (100) copies to the state agricultural society in exchange for a like number of its annual reports; and a sufficient number of copies to each county horticultural society to supply one copy to each of its members, provided, such county society shall be in active existence, and shall have filed with the Secretary of the State Horticultural Society a list of its officers, and committees and an abstract of its proceedings for the year preceding; and the remaining copies shall be distributed by the State Horticultural Society, in such manner as it shall deem best, after retaining a sufficient number for its library and to supply future members and exchanges.

SEC. 2. This act shall take effect and be in force from and after its passage.

Approved, February 28, 1883.

THE LAW OF MINNESOTA ON FRUIT STEALING.

From pages 61 and 62, General Laws of 1867

An Act for the protection of fruit and ornamental trees, shrubs, vines, and vegetable productions.

Be it enacted by the Legislature of the State of Minnesota:

SECTION 1. That if any person or persons in this state shall hereafter enter the enclosure of any person, without the leave or license of such owner, and pick, destroy, or carry away the fruit, or any portion thereof, of any apple, pear, peach, plum, grape, or other fruit tree, bush, or vine, or any vegetable products, such person shall be deemed guilty of a misdemeanor, and upon conviction thereof, may be fined any sum not less than ten nor more than fifty dollars, and imprisoned in the county jail for any period not exceeding thirty days.

SEC. 2. That if any person or persons in this state shall wilfully and maliciously, and without lawful authority, cut down, root up, sever, injure, peel, destroy or carry away, any fruit or ornamental tree, or shrub, cultivated root, plant, or vine, of whatever kind, or any fruit or other vegetable production, standing, or growing on, or being attached to the land of another, or shall wilfully, and without lawful authority, cut down, root up, destroy or injure, in any manner, or carry away any fruit or ornamental tree, plant, shrub, or vine, upon any street, lane, alley, public highway, or public grounds, in any city, town, or village in this state, such person or persons so offending shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not more than five hundred dollars, or by imprisonment in the county jail not exceeding three months, or both fine and imprisonment, at the discretion of the court having jurisdiction of the case, and shall, moreover, be liable double the amount of damages to the party injured.

SEC. 3. The penalties incurred by violation of this act may be enforced by indictment in any court having jurisdiction of misdemeanors in the county where the offence is committed, or the fine may be recovered in an action for debt before any justice of the peace of such county.

SEC. 4. This act shall take effect and be in force from and after its passage.

Approved March 9, 1867.

ADDITIONAL MEMBERS FOR 1883,

The following members paid their dues for 1883 after the report of that year went to press:

J. H. Bryant, St. Paul.	C. H. Cannon, St. Paul.
*E. H. Cuzner, Minneapolis.	John S. Dore, Neilsoille, Wis.
John F. Gilmore, Richfield.	J. C. Kramer, La Crescent.
H. E. Lowell, Minneapolis.	R. Knapheide, St. Paul.
A. R. Spaulding, Lake City.	S. D. Richardson, Hampton, Ia.
†W. G. Henderson, St. Paul.	W. B. Quinn, St. Paul.

*Over-payment—refunded by order, dated Feb. 2, 1884.

†Over-payment—carried to list of 1884 without further payment.

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* Errata—page 13 for Summer meeting, 1884, read 1883.

“ “ 13 for Annual report 1884, read 1883.

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Miss Sara Manning.....	118
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Charles Ludluff.....	203
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*ERRATA—

Page 21, 3d line—for "Hodges" read "Bowen."

Page 51—add Truman M. Smith and M. Pearce to list of life members.



ANNUAL REPORT
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY

FOR THE YEAR 1885,

EMBRACING THE

TRANSACTIONS OF THE SOCIETY FROM MARCH 1, 1884,
TO MARCH 31, 1885; ALSO PROCEEDINGS OF
THE ANNUAL MEETING OF THE MINNE-
SOTA AMBER CANE ASSOCIATION,
ESSAYS, REPORTS, ETC.

VOL. XIII.



PREPARED BY THE SECRETARY S. D. HILLMAN, MINNEAPOLIS, MINN.

ST. PAUL, MINN:
THE PIONEER PRESS COMPANY.
1885.



LETTER OF TRANSMITTAL TO THE GOVERNOR.

OFFICE OF THE SECRETARY, }
MINNEAPOLIS, March 31, 1885. }

To Hon. L. F. Hubbard, Governor of Minnesota:

SIR: I have the honor to submit herewith, in compliance with legal requisition, the accompanying report for 1885, with supplementary papers.

Respectfully yours,
S. D. HILLMAN,
Secretary Minnesota State Horticultural Society.

OFFICERS AND MEMBERS FOR 1885.

PRESIDENT.

TRUMAN M. SMITH.....St. Paul

VICE-PRESIDENTS.

A. W. SIAS.....Rochester
F. G. GOULD.....Excelsior
M. CUTLER.....Sumter
G. W. FULLER.....,.....Litchfield
E. H. S. DARTT.....Owatonna

SECRETARY.

S. D. HILLMAN.....Minneapolis

TREASURER.

J. T. GRIMES.....Minneapolis

EXECUTIVE COMMITTEE.

The President, Secretary and Treasurer *ex officio* and

J. S. HARRIS.....La Crescent
J. M. UNDERWOOD.....Lake City
WYMAN ELLIOT.....Minneapolis
DITUS DAY.....Farmington
M. PEARCE.....Minneapolis

ENTOMOLOGIST.

Prof. N. H. WINCHELL.....Minneapolis

LIBRARIAN.

E. A. CUZNER.....College of Agriculture, Minneapolis

COMMITTEE ON SEEDLING FRUITS.

J. S. HARRIS.....La Crescent

COMMITTEE ON NOMENCLATURE.

A. W. SIAS.....Rochester

E. H. S. DARTT.....Owatonna

WYMAN ELLIOT.....Minneapolis

COMMITTEE ON FORESTRY.

S. M. EMERY.....Lake City

F. G. GOULD.....Excelsior

M. CUTLER.....Sumter

COMMITTEE ON FRUIT BLOSSOMS.

C. W. HALL.....Minneapolis

GEORGE P. PEPPER.....Pewaukee, Wis.

M. PEARCE.....Minneapolis

COMMITTEE ON RUSSIAN APPLES.

A. G. TUTTLE.....Baraboo, Wis.

A. W. SIAS.....Rochester

ANDREW PETERSON.....Waconia

COMMITTEE ON VEGETABLE GARDENING.

KNIGHT H. WHIPPLE.....Northome

FRED. BUSCH.....Richfield

W. H. BRIMHALL.....St. Paul

COMMITTEE ON SMALL FRUITS.

Prof. L. ASIRE.....Minneapolis

O. M. LORD.....Minnesota City

ISAAC GILPATRICK.....Minneapolis

COMMITTEE ON FLORICULTURE.

Mrs. C. O. VAN CLEVE.....Minneapolis

Mrs. A. MORSE.....Minneapolis

Mrs. J. F. RODGERS.....Lake City

GENERAL FRUIT COMMITTEE.

SIDNEY CORP.....	Hammond
D. K. MIECHENOR.....	Etna
CHARLES BRENDERMULE.....	Moorhead
C. E. SHANNON	Granite Falls
O. F. NORWOOD.....	Balatine, Lyon County
M. C. BUNNELL.....	Newport
J. N. STUBBS.....	Long Lake
GEORGE S. BARNES.....	Fargo, Dak.
WILLIAM MCHENRY.....	St. Charles
O. M. LORD.....	Minnesota City
CLARENCE WEDGE.....	Albert Lea
E. MEYER.....	St. Peter
M. CUTLER.....	Sumter
G. W. FULLER.....	Litchfield
L. E. DAY	Farmington
CHARLES LUDLUFF.	Carver
W. E. BRIMHALL.....	St. Paul

SUPERINTENDENTS OF EXPERIMENTAL STATIONS.

PROF. EDWARD D. PORTER.....	University Farm, Minneapolis
PETER M. GIDEON	Excelsior
M. PEARCE.....	Northome
G. W. FULLER... ..	Litchfield
A. W. SIAS.....	Rochester
R. M. PROBSTFIELD.....	Moorhead
F. J. SCHREIBER.....	Moorhead
ANDREW PETERSON.....	Waconia
CHARLES LUDLUFF.....	Carver
UNDERWOOD & EMERY.....	Lake City
B. TAYLOR	Forestville
FRED VON BAUMBACH.....	Alexandria
E. H. S. DARTT	Owatonna
L. E. DAY.....	Farmington
J. H. BROWN	Lac qui Parle
J. S. HARRIS	La Cr�scent

— — —
 The members of the General Fruit Committee are expected to report separately on all matters of interest in Horticulture, but more especially to bring to the notice of the society new and improved fruits.

ANNUAL MEMBERS, 1885.

ACKERMAN, J. H.....	Young America
ANDREWS, JOHN P.....	Faribault
BEEBE, A.....	Faribault
BLAKELEY, RUSSELL.....	St. Paul
BRACKETT, GEO. A.....	Minneapolis
BRADLEY, R. H.....	Henry, Dak.
BRASLAN, CHARLES P.....	Minneapolis
BRIMHALL, W. E.....	St. Paul
BRIMHALL, W. H.....	St. Paul
BUNNELL, M. C.....	Newport
BUSCH, FRED.....	Richfield
BUSSE, F. H.....	Minneapolis
CALE, J. J.....	Minnetonka
CANNON, WILLIAM.....	Fort A. Lincoln, Dak.
CASS, LOUIS A.....	Blunt, Dak.
CASSIDAY, J. J.....	Rochester
CHANDLER, E. W.....	Minnehaha
CLAUSSEN, EMIL J.....	Bismarck, Dak.
CORP, SIDNEY.....	Hammond
CUTLER, M.....	Sumter
CUZNER, E. A.....	Minneapolis
DARTT, E. H. S.....	Owatonna
DAY, DITUS.....	Farmington
DAY, L. E.....	Farmington
DEMO, ANTHONY.....	Hokah
DEWEY, F. G.....	Esmond, Dak.
DUNBAR, HENRY N.....	Winnebago City
DUNTON, H. J.....	Clearwater
EBERT, C. F.....	Tomah, Wis.
FAIRCHILD, H. S.....	St. Paul
FORD, F. C.....	Newport
FORD, J. A.....	Newport
FORSTER, WILLIAM.....	Chatfield
GIDEON, JOSIAH.....	Excelsior
GILMORE, J. F.....	Richfield
GILPATRICK, ISAAC.....	Minneapolis
GOULD, F. G.....	Excelsior
GOULD, MRS. F. G.....	Excelsior
GROAT, H. G.....	Anoka
HARRIS, EUGENE E.....	La Crescent

HARRIS, FRANK I.....	La Crescent
HENDRICKSON, W. G.....	St. Paul
HILLMAN, S. D.....	Minneapolis
HOAG, M. J.....	Rochester
INGERSOLL, D. W.	St. Paul
JENKINS, J. W.....	Champlin
KENNING, CHARLES.....	Bird Island
KLINE, JACOB.....	Hokah
KRAMER, J. C.....	La Crescent
LATHAM, A. W.....	Excelsior
LORING, C. M.....	Minneapolis
LOSSING, WILLIAM.....	Hokah
LYONS, WILLIAM.....	Minneapolis
MCDUGALL, JOHN.....	Fergus Falls
MCINTOSH, WILLIAM.....	Langdon
MEIGHEN, T. J.....	Forestville
MENDENHALL, R. J.....	Minneapolis
MERRILL, D. D.....	St. Paul
NAGLE, E.....	Minneapolis
NOBLES, J.....	Glencoe
NORTHROP, J. E.....	Minneapolis
ORR, ANDREW.....	Long Prairie
PETERSON, J. W.....	Olivia
PHILLIPS, A. J.....	Blunt, Dak.
PORTER, PROF. EDWARD D.....	Minneapolis
PUFFER, F. L.....	Bird Island
REED, A. H.....	Glencoe
ROBERTS, C. C.....	Lake City
SEAGER, F. B.....	Cannon Falls
SHANNON, C. E.....	Granite Falls
SHEERAN, P. C.....	St. Paul
SHERMAN, A.....	Canton, Lincoln County, Dak.
SMITH, C. L.....	Minneapolis
SMITH, FLORENCE.....	Cresbard, Faulk County, Dak.
SOMERVILLE, WILLIAM.....	Viola
SPRAGUE, MRS. L. E. P.....	Minneapolis
STARR, O. A.....	Montevideo
STUBBS, N. J.....	Long Lake
STURTEVANT, F. W.....	Montevideo
TANNER, WILLIAM.....	Cannon Falls
TAYLOR, B.....	Forestville
THOMPSON, T. J.....	Northville, Dak.

TRAIN, H. B.....	Hokah
UNDERWOOD, J. M.....	Lake City
UNDERWOOD, MRS. ANNA B.....	Lake City
WARD, C. W.....	Sumter
WEBSTER, H.....	Lake City
WEDGE, CLARENCE.....	Albert Lea
WEDGE, S.....	Rochester
WHIPPLE, KNIGHT H.....	Northome
WINCHELL, PROF. N. H.....	Minneapolis
WOOD, H. D.....	Minneapolis
WOODRUFF, PHILO.....	Faribault
WRIGHT, JAMES.....	Minnesota City

ADDITIONAL MEMBERS FOR 1884.

The following members paid their dues for 1884 after the report for that year went to press, and in the order following:

F. J. SCHREIBER.....	Moorhead
E. H. S. DARTT.....	Owatonna
J. H. BRYANT.....	St. Paul
MICHAEL KNOPP.....	Winona
L. MCCURDY.....	Mitchell, Dak.
G. W. HARRINGTON.....	Plainview
T. BARRETT.....	Herman
HOLLIS GIBSON.....	Fremont, Wis.
J. W. TAYLOR.....	Winnepeg, Manitoba
H. I. THOMPSON.....	Lake City
J. COLE DOUGHTY.....	Lake City
JOHN C. FOWLER.....	Lake City
M. C. COOK.....	Rochester
C. E. SHANNON....	Granite Falls
P. B. NETTLETON.....	Montevideo
JOHN W. PETERSON.....	Olivia
J. NOBLES.....	Sumter
WM. CAREY.....	Glencoe
R. F. SMITH.....	Montevideo
C. M. STEVENS.....	Clearwater
H. J. DUNTON.....	Clearwater
W. T. RIGBY.....	Clearwater
JAMES JENKS.....	Clearwater
J. WHITING.....	Clearwater

JOHN A. FORD.....	Newport
H. G. GROAT.....	Anoka
ANDREW HOLES.....	Moorhead
JOHN A. SALZER.....	La Crosse, Wis.
CHARLES KENNING.....	Bird Island
NELS ANDERSON.....	Lake City
DR. F. L. PUFFER.....	Bird Island
ETHAN CRANDALL.....	Sumter
REV. O. H. TH. SOLEIN.....	Holstad
E. S. GOFF.....	N. Y. Experimental Station, Geneva, N. Y.
WM. LAING MEASON.....	Lesser Dog Creek, Clinton, British Col.
A. J. PHILLIPS.....	West Salem, Wis.
B. CONVERSE.....	St. Paul
GEORGE JEHU.....	Hastings
E. DE BELL.....	Sioux Falls, Dak.
P. C. SHERAN.....	St. Paul
W. L. WILSON.....	St. Paul
C. H. PRESCOTT.....	St. Paul

HONORARY MEMBERS FOR FIVE YEARS.

MISS HORTENSE SHARE, from 1880.....	Rosemount
MRS. L. E. P. SPRAGUE, from 1880.....	Minneapolis
MRS. ISAAC ATWATER, from 1880.....	Minneapolis
MRS. W. R. MURRAY, from 1881.....	Lake City
GEORGE J. KELLOGG, from 1882.....	Janesville, Wis.
G. P. PUTNAM, from 1882.....	Ash Ridge, Wis.

HONORARY LIFE MEMBERS.

HON. MARSHALL P. WILDER.....	Boston, Mass.
DR. JOHN A. WARDER (deceased).....	North Bend, Ohio
DR. P. A. JEWELL (deceased).....	Lake City
HON. L. B. HODGES (deceased).....	St. Paul
HON. N. J. COLMAN.....	St. Louis, Mo.
GEORGE P. PEPPER.....	Pewaukee, Wis.
J. C. PLUMB.....	Milton, Wis.
J. M. SMITH.....	Green Bay, Wis.
E. WILCOX.....	La Crosse, Wis.
PROF. J. L. BUDD.....	Ames, Ia.
A. G. TUTTLE.....	Baraboo, Wis.
F. K. PHENIX.....	Delavan, Wis.
J. W. MANNING.....	Redding, Mass.
MRS. J. W. MANNING.....	Redding, Mass.
MRS. WM. PAIST.....	Hersey
CHARLES Y. LACY.....	Fort Benton, M. T.
COL. J. H. STEVENS.....	Minneapolis
J. S. HARRIS.....	La Crescent
R. J. MENDENHALL.....	Minneapolis
TRUMAN M. SMITH.....	St. Paul
L. M. FORD.....	St. Paul
WYMAN ELLIOT.....	Minneapolis
CHARLES HOAG.....	Minneapolis
J. T. GRIMES.....	Minneapolis
MRS. C. O. VAN CLEVE.....	Minneapolis
A. W. SIAS.....	Rochester
PETER M. GIDEON.....	Excelsior
MRS. WEALTHY GIDEON.....	Excelsior
D. W. HUMPHREY.....	Faribault
M. PEARCE.....	Minneapolis
R. L. COTTERELL.....	Dover Center
CHAS. LUDLUFF.....	Carver
MRS. JAMES BOWEN.....	Minneapolis
MRS. IDA E. TILSON.....	West Salem, Wis.
MRS. H. B. SARGEANT.....	Lake City
MISS SARAH MANNING.....	Lake City
COL. D. A. ROBERTSON.....	St. Paul

OFFICERS

OF THE

MINNESOTA STATE AGRICULTURAL SOCIETY.

FOR THE YEAR 1885.

PRESIDENT.

N. P. CLARKE.....St. Cloud

VICE-PRESIDENTS.

C. A. DEGRAFF.....Janesville

C. P. BAILEY.....Duluth

SECRETARY.

R. C. JUDSON.....Farmington

TREASURER.

F. J. WILCOX.....Northfield

BOARD OF MANAGERS.

JAS. McHENCH.....Fairmount

J. S. HARRIS.....La Crescent

ADAM BOHLAND.....St. Paul

CLARKE CHAMBERS.....Owatonna

JOHN COOPER.....St. Cloud

JOHN F. NORRISH.....Hastings

The next Annual Fair will be held on the new State Fair Grounds between Minneapolis and St. Paul, Sept. 7 to 12, 1885. No efforts will be spared to make it the greatest and best agricultural and horticultural exposition of the year.

Liberal premiums offered in every department.

CONSTITUTION

OF THE

MINNESOTA HORTICULTURAL SOCIETY.

ARTICLE I.

NAME.

This society shall be known as the Minnesota State Horticultural Society.

ARTICLE II.

OBJECT OF THE SOCIETY.

The object of this society shall be to improve the condition of pomology, horticulture and arboriculture, by collecting and disseminating correct information concerning the culture of such fruits, flowers, trees, and other productions in horticulture as are adapted to the soil and climate of Minnesota.

ARTICLE III.

MEMBERSHIP.

Any person may become a member by paying to the Secretary or treasurer an annual fee of one dollar, or a life member by the payment of ten dollars. Honorary members, for a time stated or for life, may be elected at any annual meeting by a two-thirds vote of the society, and shall be entitled to all the rights and privileges of membership.

ARTICLE IV.

OFFICERS.

Its officers shall consist of a president and one vice president from each congressional district, a secretary, treasurer, and an executive committee of five, and a librarian.

ARTICLE V.

DUTIES OF PRESIDENT AND VICE PRESIDENTS.

The President shall preside at and conduct all meetings of the society, and deliver an annual address, and in his absence the Vice Presidents, in their order, shall perform the same duties. They shall also have a general supervision of the horticultural interests in their respective districts, and make a written report to the society as its annual winter meeting; in consideration of which the society shall pay their traveling expenses to the same.

ARTICLE VI.

THE SECRETARY.

The Secretary shall record all the doings of the society, collate and prepare all communications, etc., for the public press, and pay over all moneys received from members or otherwise to the treasurer on his receipt; receive and answer all communications addressed to the secretary, establish and maintain correspondence with all local, county, district and state horticultural societies, and secure by exchange their transactions, as far as possible; to aid the president as an executive officer in the dispatch of business relating to meetings of the society, notices of horticultural and similar meetings of general interest, and report to the annual meeting of the society an abstract of the matter that has come into his possession, which, with its approval, shall become part of its transactions for the current year.

ARTICLE VII.

THE TREASURER.

The Treasurer shall collect and hold all funds of the society, and pay out the same only on the order of the president, countersigned by the secretary. He shall make up a report of all

the receipts and disbursements of the society, and present the same at the annual winter meeting, or at any other time when called upon to do so by the executive committee. He shall give bonds in such sum as the society may direct, to be approved by the president and secretary, and the bond when so approved shall be filed with the state auditor.

ARTICLE VIII.

ELECTION OF OFFICERS.

The officers shall be elected separately and annually by ballot, and hold their office until their successors are elected.

ARTICLE IX.

MEETINGS OF THE SOCIETY.

The society shall hold annual sessions on the third Tuesday of January, and other meetings at such time and place as the society may direct.

ARTICLE X.

THE LIBRARIAN.

The librarian shall have charge of the library and report its condition at each annual meeting.

ARTICLE XI.

AMENDMENTS.

By-laws and alterations of the constitution, for the purpose of meeting the further wants of the society, may be enacted by a vote of two-thirds of the members present at any regular annual meeting, and on one day's notice of the same being given.

BY-LAWS.

1. The president, at each annual meeting of the society, shall appoint a general fruit committee, consisting of two members from each congressional district in the State, and it shall be the duty of each member to make a written report annually upon the fruit crop, and a limited list of fruits best adapted for general cultivation in their respective districts.

2. The president, secretary and treasurer shall be members *ex officio* of the executive committee, who shall have charge of all matters pertaining to the interests of the society.

3. The executive committee may call a meeting of the society at any time they may deem advisable, giving at least thirty days' notice through the public press.

4. The executive committee shall appoint a committee on seedlings, on nomenclature, on forestry, on fruit blossoms, on Russian apples, on gardening, on small fruits, and on floriculture.

5. The five members of the executive committee, not including the president, secretary or treasurer, shall be a committee on finance, and it shall be their duty to audit all bills before they shall be ordered paid by the president and secretary.

6. The executive committee shall see that a program is issued for each meeting of the society, at least one month before the winter meeting and ten days before the summer meeting.

7. Every member shall be entitled to one copy of the transactions as often as published, on which postage shall be paid; but in the distribution of all other copies the party receiving the same shall pay the postage; where several copies are sent to auxiliary societies it shall be discretionary with the secretary to pay the freight.

8. *Quorum*—A quorum shall consist of nine members of the society, or a majority of the executive committee.

MINNESOTA STATE HORTICULTURAL SOCIETY.

TRANSACTIONS 1884-5.

THE SUMMER MEETING, 1884.

It should be stated here that no report was received of the proceedings of the summer meeting from ex-secretary Gibbs, and the following report has been prepared from such data as could be obtained from the daily papers and other sources of information. Mr. Gibbs, writing from New Orleans under date of March 28, 1885, states that the report was handed to his clerk on or about February 4th, with directions to be mailed to the secretary of the Horticultural Society, and if not received must have been misdirected; but that he had not preserved the notes from which the report was made up. He says in closing: "I am sorry that absorbing duties here, together with weakness from recent severe illness, prevent me from contributing more to your report for 1885, but I presume you have abundant material, and will make the report equal to, and I hope better than, any of its predecessors."

The call for the summer meeting announced that the session would be held at Market Hall, Minneapolis, on Tuesday and Wednesday, June 24 and 25, 1884, for the exhibition of small fruits, flowers and early vegetables. The public were cordially invited, free entertainment promised to members in attendance by the citizens of Minneapolis, and the usual reduced rates upon the railroads to members returning to their homes.

PROGRAM.

FIRST DAY—TUESDAY, JUNE 24.

ENTRIES FROM 9 A. M. TO 3 P. M.—NONE LATER.

At 2 P. M.—Opening exercises, addresses, volunteer papers, question box and discussions.

Appointment of judges on premiums.

SECOND DAY,—WEDNESDAY, JUNE 25.

The exhibition will open at 9 A. M. Premiums announced and paid at 10 o'clock.

The meeting will be informal and social, and at 12 M. the exhibitors, members and invited guests will confiscate the entire display of fruits for the purposes of a basket picnic dinner.

At 2 P. M.—Addresses, question box, volunteer papers and discussions, general business, and final adjournment, or such other exercises as may be agreed upon.

OLIVER GIBBS, JR.,

Lake City,

Secretary.

TRUMAN M. SMITH,

St. Paul,

President.

PREMIUM LIST.

WYMAN ELLIOT, Superintendent of Exhibits.

STRAWBERRIES.

Best display, not less than six varieties. 1st premium, \$5; 2d, \$4;
3d, \$3; 4th, \$2.

Best variety for general market, \$3.

Best variety for home use, perfect in flower, \$3.

Best three plants in bearing, grown in pots, \$3; 2d, \$2.

1st Prem. 2d Prem.

Best quart Wilson's Albany.....	\$1 00	50 cts.
Best quart Charles Downing.....	1 00	50
Best quart Downer's Prolific.....	1 00	50
Best quart Green Prolific.....	1 00	50
Best quart Crescent Seedling.....	1 00	50
Best quart Captain Jack.....	1 00	50
Best quart Cumberland Triumph.....	1 00	50
Best quart Miner's Great Prolific.....	1 00	50
Best quart Red Jacket.....	1 00	50
Best quart Pioneer.....	1 00	50
Best quart Glendale.....	1 00	50
Best quart Endicott No. 2	1 00	50
Best quart Sharpless.....	1 00	50
Best quart Manchester.....	1 00	50
Best quart Bidwell	1 00	50
Best quart Minnetonka Chief.....	1 00	50
Best quart Hart's Minnesota Seedling.....	1 00	50
Best quart Kentucky.....	1 00	50
Best quart Windsor Chief.....	1 00	50
Best quart Boyden	1 00	50
Best quart James Vick	1 00	50
Best quart Iowa Prolific.....	1 00	50
Best quart variety not herein named.....	1 00	50

CHERRIES.

	1st Prem.	2d Prem.
Best quart Early Richmond.....	\$2 00	\$1 00
Best quart any other variety.....	2 00	1 00

Strawberries and Cherries will be displayed on tea-plates to be furnished by the Society.

PLANTS AND FLOWERS.

Best display greenhouse plants.....	10 00	5 00
Best display roses in pots.....	2 00	1 00
Best display fuchsias.....	2 00	1 00
Best display geraniums.....	2 00	1 00
Best floral design in cut flowers.....	2 00	1 00
Best basket cut flowers.....	2 00	1 00
Best hand bouquet cut flowers.....	2 00	1 00
Best bouquet of roses.....	2 00	1 00
Best single plant in bloom.....	2 00	1 00

VEGETABLES.

Best display.....	5 00	3 00
Best half peck green peas.....	1 00	50
Best half peck string beans.....	1 00	50
Best six bunches onions.....	1 00	50
Best six bunches beets.....	1 00	50
Best six bunches radishes.....	1 00	50
Best six bunches carrots.....	1 00	50
Best six bunches turnips.....	1 00	50
Best six bunches asparagus.....	1 00	50
Best three heads cabbage.....	1 00	50
Best three heads cauliflowers.....	1 00	50
Best three heads lettuce.....	1 00	50
Best three bunches kohl rabi.....	1 00	50
Best six cucumbers.....	1 00	50
Best six stalks pie plant.....	1 00	50

The exhibition is open in all departments to growers in Minnesota, Wisconsin, Dakota, and Northern Iowa.

M. PEARCE,

J. T. GRIMES,

WYMAN ELLIOT,

Com. of Arrangements, Minneapolis.

PROCEEDINGS AT THE SUMMER MEETING.

TUESDAY, JUNE 24, 1884.

The summer meeting of the Minnesota State Horticultural Society was opened at 3:30 o'clock, P. M., Tuesday, June 24th, and was called to order by President Truman M. Smith of St. Paul, who expressed regret at the apparent lack of interest in the meeting as shown by the number of people in attendance, especially from Minneapolis. He did not see what could be done under the circumstances except to discuss questions of interest to horticulturists as best they could; he did not doubt that other exhibitors would be present at the meeting in the morning if entries were permitted to be made at that time. He stated that there had been a good deal of interest taken usually at the summer meetings, but if the number present was an indication of the interest manifested in horticulture it was certainly at a low ebb.

Col. J. H. Stevens thought the present time an unfortunate one as there were so many counter attractions to draw people away, and our French citizens, among whom were found some of the best fruit and flower growers, were celebrating the day.

Secretary Gibbs said that in previous years the first day's session had often been a poor one while on the following day the attendance might be good and exhibits large. He then offered the following resolution as a solution of the unexpected difficulty:

Resolved, That the entries be extended till 9 A. M. to-morrow, but the judges shall make allowance on products exhibited in favor of those who have entered within the rule, other things than condition being equal, and that a list of fruits, flowers and vegetables put on exhibition to-day shall be furnished to the judges for comparison with those made under the extension of time.

Mr. Peter M. Gideon opposed the resolution and said he thought the fruits on the tables would not bear a favorable comparison with those that might be brought in the morning, and it would be an injustice to those who had been promptly on hand with their exhibits.

Mr. Wyman Elliot was opposed to any action being taken which would be unjust towards prompt exhibitors, but thought the matter could be arranged satisfactorily.

Mr. J. T. Grimes thought exhibits brought in the morning should be placed on a separate table, and the judges in making inspections should take into consideration the causes of difference, if any, in the condition, and that at future meetings of the society the articles should actually be on exhibition when entries were made.

The resolution of Mr. Gibbs was then adopted, as was the following, offered by Mr. Grimes:

That all articles entered be allowed premiums in their different classes if considered worthy by the viewing committees, such premiums not to exceed those offered in the regular list of premiums.

It was moved that the president be authorized to appoint committees to view exhibits made in the three departments of fruits, flowers and vegetables, but after discussion he was granted till 9 o'clock Wednesday morning to make up the list of committeemen, and the motion was then adopted.

Mr. M. Pearce of Minneapolis, announced that the Hennepin County Horticultural Society was preparing to make a public exhibition of grapes and apples this fall, and asked the co-operation and assistance of kindred societies throughout the State. He said the exhibit would be largely made up from farms near Lake Minnetonka, and it was believed that it would be entirely successful.

On motion of Mr. Gibbs the chair was empowered to appoint a committee of three from the State society to attend the meeting referred to, and Messrs. A. W. Sias, Oliver Gibbs, Jr., and G. H. Howe were appointed as such committee.

Secretary Gibbs notified the society that F. G. Gould of Excelsior, had been appointed to superintend the horticultural exhibits of Minnesota at the world's fair, to be held in New Orleans next winter, \$1,000 having been appropriated by the State Board of Collective Exhibits department to defray the expenses of the Minnesota exhibit at New Orleans.

GROWING SMALL FRUITS.

The secretary announced that the exhibit of strawberries will be much larger at the morning session, and suggested that growers make a statement of important discoveries made in strawberry culture during the past year.

Col. D. A. Robertson, of St. Paul, being called on, referred to the growing interest in horticultural pursuits, giving special credit to the services of Nicholas Longworth, of Cincinnati, in producing a spirit of rivalry in horticultural work. The race from which we have a descent began horticultural work in their gardens, and the production of fruit-bearing vines—the grape especially—had been made a success in Ohio and Indiana after repeated failures. The successful introduction of grapes and small fruits from seedlings still remains a theme of the utmost consequence to the entire horticultural interest of Minnesota. This great work, however, must not be done by practical men, but by amateurs who have the time, wealth and disposition to indulge in experiments for the benefit of others.

Mr. A. W. Sias, of Rochester, mentioned the sale of one hundred dollars worth of seedling apple trees to an Olmsted county man about ten years ago; four years ago these trees bore fruit as large as the Baldwin, and equally bright in color and palatable in flavor; he has grafted from the new seedling, and on the twigs day before yesterday were found blossoms.

Col. Robertson thought the blossoms on these infantile shoots should be taken off, because there was danger of precocity in the limbs of trees, as well as elsewhere; plants must be adapted to climate and other conditions, and our fruit trees can be made successful only by careful selections from the seedlings.

Secretary Gibbs announced that the reports of the last meeting of the society were now ready for distribution and could be obtained by calling on him in the morning.

Among the list of those making entries for premiums, during the day, were the following:

Strawberries—T. M. Smith, Oliver Gibbs, Jr., Frank Abernathy, P. M. Gideon, M. J. Hoag, A. W. Sias, W. H. Brimhall, J. T. Grimes, Wyman Elliot, Geo. S. Woolsey, F. G. Gould; thirty-seven entries.

Plants and Flowers—Mrs. Truman M. Smith, J. T. Grimes, Mendenhall Greenhouse; eleven entries.

Vegetables—J. S. Gray, J. T. Grimes, Fred. Busch, Wyman Elliot; twenty three entries.

The exhibit was somewhat meagre and imperfect, but included a fine floral display from the State University and about eighteen specimens of strawberries, principally from Lake Minnetonka.

The meeting adjourned until 9 o'clock Wednesday morning.

SECOND DAY.

WEDNESDAY, JUNE 25, 1884.

There was a largely increased attendance at the meeting of the society Wednesday morning over that of the previous day. Many additional entries were made. Nine entries were added to the list under the head of strawberries and about as many more of plants, flowers and vegetables. The list was closed at nine o'clock.

The meeting was called to order by President Smith shortly before ten o'clock, who announced the appointment of the following judges to examine the exhibits made and award premiums:

COMMITTEES ON PREMIUMS.

Fruits—M. Pearce, G. H. Howe, of Minneapolis; and M. C. Bunnell, of Newport.

Flowers—E. S. Spaulding, C. H. Burwell, of Newport; and A. W. Sias, of Rochester.

Vegetables—H. F. Busse, of Minneapolis; J. A. Ford, of Newport; and E. P. C. Fowler, of Lake City.

The judges went to work upon the examination of the various exhibits, but it was noon before the official announcement of awards was made of premiums by the secretary.

There were about fifty persons present, including a number of ladies, during the day, and among horticulturists present may be mentioned Truman M. Smith, president of the society; Secretary Oliver Gibbs, Jr., of Lake City, with his wife; J. T. Grimes, treasurer; P. M. Gideon, superintendent of the State

Experimental Fruit Farm; F. G. Gould, Excelsior, horticultural delegate to the New Orleans Exposition; Wyman Elliot, Col. J. H. Stevens, of Minneapolis; W. E. Brimhall, Col. D. A. Robertson, St. Paul; J. S. Gray, M. Pearce, W. J. Abernethy, Minneapolis; M. W. Cook, A. W. Sias, M. J. Hoag, Rochester; Fred. Busch, George Labbett and wife, Wm. Lyons, C. H. Burwell, Charles H. Clarke, H. F. Busse, E. S. Spaulding, G. T. Gibbs and wife, Lake City; J. W. Manning and wife of Redding, Massachusetts; Lewis Chase, of Rochester, New York.

One of the most interesting features among the exhibits was sixteen boxes of strawberries of the Wilson variety, displayed by F. G. Gould, of Excelsior, grown near Lake Minnetonka, which were considered equal to any similar exhibit ever made in the State. Secretary Gibbs, of Lake City, also had a very fine display of Wilsons. Another interesting feature was a creditable display of blooming plants, cut flowers and floral designs from the Mendenhall greenhouse, of Minneapolis. This occupied a table forty-five feet long and three feet wide, at one end of the hall, and was the occasion of many complimentary remarks, both on account of the perfection of the plants and the arrangement of the display. The two most noticeable floral designs were a lyre of white roses and pansies, from the Mendenhall greenhouse, and a large and most exquisite platter of pansies, arranged in designs by color, displayed by Geo. S. Woolsey, of Minneapolis. A beautiful display of roses, by Mrs. T. M. Smith, of St. Paul, was also much admired.

PREMIUMS AWARDED.

The judges having made their awards, the list of premiums was read as follows:

STRAWBERRIES.

Wilson.—F. G. Gould, Excelsior, best display, first premium; George J. Kellogg, Janesville, Wis., second. General Market Variety, Oliver Gibbs, Jr., Lake City, first premium. F. G. Gould, Excelsior, best quart, first premium; W. H. Brimhall, St. Paul, second.

Downer's Prolific.—M. J. Hoag, Rochester, best quart, first premium; William Lyons, Minneapolis, second.

Crescent Seedling.—M. J. Hoag, Rochester, best quart, first premium; J. T. Grimes, second.

Cumberland Triumph.—A. W. Sias, Rochester, best quart, first premium; F. W. Abernethy, Minneapolis, second.

Glendale.—Oliver Gibbs, Jr., Lake City, best quart, first premium; Wm. Lyons, Minneapolis, second.

Endicott No. 2.—Oliver Gibbs, Jr., Lake City, best quart, first premium.

Mount Vernon.—P. M. Gideon, Excelsior, best quart, first premium.

Sharpless.—A. W. Sias, Rochester, best quart, first premium.

Manchester.—J. A. Ford, Newport, best quart, first premium.

Minnetonka Chief.—Wyman Elliot, Minneapolis, best quart, first premium.

Windsor.—William Lyons, Minneapolis, best quart, first premium.

James Vick.—F. G. Gould, Excelsior, best quart, first premium.

Jersey Queen.—P. M. Gideon, Excelsior, best quart, first premium.

Iowa Prolific.—Truman M. Smith, St. Paul, best quart, first premium.

PLANTS AND FLOWERS.

Greenhouse Display.—Mendenhall Greenhouse, first premium.

Display Fuchsias.—Mendenhall, first premium.

Floral Design.—Mendenhall, first premium.

Display Geraniums.—Mendenhall, first premium.

Basket Cut Flowers.—Mrs. T. M. Smith, St. Paul, first premium; Mendenhall second.

Hand Bouquet.—Mendenhall, first premium.

Bouquet Roses.—Mrs. T. M. Smith, St. Paul, first premium; Mendenhall second.

Single Plant in Bloom.—Mendenhall, first premium.

Hybrid Perpetual Roses.—F. G. Gould, Excelsior, first premium; J. T. Grimes, Minneapolis, second.

A fine collection of roses from Mrs. W. G. Hendrickson, of St. Paul, was received too late for entry.

VEGETABLES.

Best Display.—J. S. Gray, Minneapolis, first premium; Wyman Elliot, Minneapolis, second.

Green Peas.—Wyman Elliot, Minneapolis, first premium.

Carrots.—Wyman Elliot, Minneapolis, first premium.

Asparagus.—J. T. Grimes, Minneapolis, first premium; Wyman Elliot, Minneapolis, second.

Cabbage.—Wyman Elliot, Minneapolis, first premium.

Cauliflower.—Wyman Elliot, Minneapolis, first premium; Fred Busch, Richfield, second.

Lettuce.—J. S. Gray, Minneapolis, first premium; Wyman Elliot, Minneapolis, second.

Pie-plant.—State farm, first premium; Wyman Elliot, Minneapolis, second.

Early Vanguard Potato.—William Lyons, Minneapolis, first premium.

The award of premiums seemed to give general satisfaction and were paid at once by the treasurer. The total amount paid was \$77, of which \$29.50 was on flowers, \$19.50 on vegetables, and \$28 on strawberries.

After the awards were made Geo. S. Woolsey, of Minneapolis, arrived with some fine specimens of seedling strawberries and a display of pansies. His tardiness being explained that he understood the meeting was to be held at the agricultural hall of the State university, the society voted to award him a special premium of \$10 for his excellent display.

After the premiums were paid the meeting was turned into a basket picnic, and the fruits on exhibition confiscated and served up with cream, etc.

AFTERNOON SESSION.

WEDNESDAY, June 25, 1884.

At 2 o'clock, P. M., the meeting was called to order by President Smith, and several matters of business announced.

A bill for printing programs, and bills for other incidental expenses, amounting to \$15, were ordered paid.

Secretary Gibbs asked for an appropriation of \$100 for post-

age and incidental expenses, in addition to the \$100 allowed at a previous meeting, which was allowed by a unanimous vote.

EXTENDING THE WORK.

Secretary Gibbs raised the question whether some action should not be taken looking toward a furthering of the interests and influence of the society, by securing new members, distributing reports, exchanging products, and working up exhibits. He advocated the gathering of scions and specimens by some authorized person or persons, depositing them at some defined place and carrying on experiments. He said that systematic work was necessary to settle many of the disputed questions of pomology and advance the interests of horticulture in the Northwest.

Prof. E. D. Porter heartily approved of the suggestion, and urged the importance of taking prompt action in the matter. He said it was with a view to encouraging such enterprises that the State had established the experimental farm. In this the society has a place, and the State also offers to supervise experiments; but it has made no provision for the collection of the material for the experiments. He recommended that a standing committee be appointed to attend to this matter and make thorough work of it. He cited some instances of successful experimental institutions, and spoke of the great opportunities offered in this region, which have been developed to a very limited extent. He maintained that the native fruits should form the basis of operations, referring particularly to the native plum, cranberry, blueberry, and apple.

Col. D. A. Robertson, of St. Paul, inquired if he would go back again to the native sour and bitter crab, or take up the line where we now have it.

Prof. Porter in reply, said that the latter plan would of course be the wiser. Notwithstanding the gold medal taken by the Minnesota apples at Philadelphia, he insisted that the ideal apple adapted to this climate has not yet been found. He hoped the society would take hold of this matter, and was confident that any efforts in this direction would be amply rewarded.

Mr. Gideon, superintendent of the State Experimental Fruit Farm, answered a number of inquiries about his seedlings, and gave a statement of the results arrived at thus far, and described the manner in which the work had been conducted during the

past six years. He stated that many of his grafts had died the past year from some cause which he was unable to explain.

Mr. Pearce thought the trouble was mainly from weak roots and not from a lack of hardiness. He thought we should grow our own varieties of apples to be obtained of our local nurserymen, rather than to purchase trees from unknown and irresponsible sources.

Secretary Gibbs stated that at the last meeting he was authorized to search out new and valuable seedlings, procure scions, etc., but that no appropriation other than fifty dollars for the purchase of scions, had been made. He did not feel called upon at a salary of four hundred dollars a year to give more of his time than his duties as secretary required, and hence should decline to do this extra labor unless an adequate appropriation were to be made.

Prof. Porter thought the present finances of the society would not warrant a further appropriation this year. He thought horticulturists would be able to secure much profit incidentally from investigations about to be made in preparing the collective exhibit for New Orleans. He moved that no special appropriation be made at present.

Treasurer Grimes called attention to the financial condition of the society in absence of \$500 to which it is entitled from the State. The receipts of the society had been \$1,218.29, and the disbursements \$950.39, leaving a balance on hand of \$267.90; but after deducting \$200 now due, there will be only \$67.90 on hand and actually available.

On motion, the treasurer was authorized to borrow funds belonging to the permanent fund, to meet current expenses, and defer adding to that fund until the first of January, 1885.

Mr. J. W. Manning, of Redding, Mass., a member of the American Pomological Society, was introduced and he and his wife were made honorary life members of the society. He expressed thanks for the honor, and complimented the society on the excellent exhibit made.

A SOUTHERN EXHIBITION.

Mr. F. G. Gould, of Excelsior, who has charge of the collection to be made in this State for an exhibit in the New Orleans exhibition next winter, stated the plan that was being pursued. He said it was proposed to have specimens of every variety of fruit grown in the State, and requested the co-operation of members

of the society in the matter. He advocated the pickling or preserving of early small fruits and the duplicating of all exhibits.

Prof. Porter gave some suggestions for the preparation of specimens, advising fruit growers to clean certain limbs of apple trees from insect depredations, and wrap specimens for exhibition with tissue paper. He advised the girdling of grape vines, or branches bearing the fruit to be exhibited, by means of which a larger and much better growth might be secured. For gooseberries and some other small fruits he recommended the English plan of setting a saucer of water underneath.

Mr. Elliot gave some suggestions as to the boxing and shipping of fruits, advising the use of parafine paper for wrapping, and very careful boxing and handling.

Secretary Gibbs deprecated the usual carelessness of experienced horticulturists in the shipment of fruit, and said he did not know what might be expected from the average farmer.

Mr. Sias, from the committee on the exhibition of fruits, etc., to be made by the Hennepin County Horticultural Society, reported favorably upon the proposition and the report was adopted.

Secretary Gibbs called attention to the law requiring local horticultural societies to make annual reports, the same to be incorporated in the transactions of the society, and stated that he had never received such reports from secretaries of such organizations.

Secretary Gibbs moved that a vote of thanks be returned to the people of Minneapolis, to local committees on entertainment, for hospitality, and to the railroads for reduced rates of transportation. The motion was adopted.

A gentleman asked the question whether the variety of apple trees known in New York as "Iron Clads" were not grown as well in Minnesota, when transplanted, as the native trees.

Mr. Gideon gave it as his opinion that the trees would succeed equally well in Minnesota, with proper attention and in favored localities.

Col. D. A. Robertson expressed the opinion that growth depended upon climatic influences almost exclusively. It is warmer in Minnesota in summer than in Philadelphia, but the winters are more rigorous here than there, and the only robust trees in Minnesota are raised from the seed. Those coming from remote districts are invariably subjected to great dangers in change of location from their native soil, and he had no confidence in eastern trees when transplanted to Minnesota.

On motion the meeting then adjourned subject to the call of the executive committee.

MEETING OF EXECUTIVE COMMITTEE.

A meeting of the executive committee was held at No. 22 Bridge Square, Minneapolis, at 2 o'clock P. M., Jan. 18, 1885.

The following members were present: President T. M. Smith, J. M. Underwood, J. S. Harris and Cyrus L. Smith.

A letter was read from Secretary Gibbs stating that he would be unable to attend the annual meeting.

President Smith appointed J. S. Harris, J. M. Underwood and C. L. Smith a committee to arrange a program for the Annual Winter Meeting.

On motion of Mr. Underwood it was voted to employ S. D. Hillman, of Minneapolis, as stenographer to report the discussions and proceedings at the annual meeting, at a compensation of five dollars per day and ten cents per folio.

The President was authorized to procure plates for the exhibition of fruits.

The committee on program presented a report which was adopted.

C. L. Smith was directed to procure the printing of two hundred and fifty copies of program, also one hundred copies of blank railroad certificates.

Adjourned till 9 o'clock, A. M., Jan. 20, 1885.

MINNESOTA

STATE HORTICULTURAL SOCIETY.

EIGHTEENTH ANNUAL MEETING,

AT THE

State Capitol, St. Paul, Minnesota,

TUESDAY, WEDNESDAY THURSDAY AND FRIDAY,

JANUARY 20, 21, 22 AND 23, 1885.

PROGRAM.

MORNING, AFTERNOON AND EVENING SESSIONS,

9 A. M., 2 P. M. AND 7 P. M.

The following order will be adhered to as nearly as circumstances will permit, but may be varied from time to time as the Society may think best.

FIRST DAY—TUESDAY, JANUARY 20th, 10 A. M.

Opening exercises.

Arrangement of exhibits.

2 P. M.—Appointment of special committees. Partial report of standing Fruit Committee.

3 P. M.—Paper on Small Fruit, by

CYRUS L. SMITH, of Minneapolis.

Strawberries on a Prairie Farm, by

M. CUTLER, of Sumter, McLeod County.

Notes from the Fruit Garden, by

WILLIAM HENRY BRIMHALL, St. Paul.

Question Box.

EVENING SESSION.

7 P. M.—President's Address, TRUMAN M. SMITH, St. Paul.

SECOND DAY — WEDNESDAY, JANUARY 21st.

9 A. M.—Paper on Apples, by

MRS. J. M. UNDERWOOD, of Lake City.

M. PEARCE, of Minneapolis, and

SIDNEY CORP, of Hammond, Wabasha County.

Revision of Fruit List.

Discussion.

AFTERNOON SESSION.

2 P. M.—Market Gardening.

J. S. HARRIS, of La Crescent.

KNIGHT H. WHIPPLE, of Northome.

J. S. GRAY, of Minneapolis, and

FRED. BUSCH, of Richfield.

Discussion.

Question Box.

EVENING SESSION.

7 P. M.—Lecture, Travels in Europe, by

PROF. TOUSLEY, of Minneapolis.

A paper on Seeds, by

J. E. NORTHRUP, of Minneapolis.

Paper on Ginseng, by

COL. J. H. STEVENS, of Minneapolis.

THIRD DAY—THURSDAY, JANUARY 22d.

MORNING SESSION.

9 A. M.—Correspondence ; reports of Committee on Russian Apples.

Report of Treasurer,	J. T. GRIMES, Minneapolis.
Report of Secretary,	OLIVER GIBBS, JR., Lake City.
Question Box.	

AFTERNOON SESSION.

2 P. M.—Report of Finance Committee.

Election of officers.

Report of Committee on Legislation.

Discussion of plan of work for ensuing year.

Question Box.

EVENING SESSION.

7 P. M.—Window Gardening, by

W. C. KILVINGTON, of Minneapolis.

Greenhouse and bedding Plants,

R. J. MENDENHALL, of Minneapolis.

Roses, by

C. L. SMITH, of Minneapolis.

This is Floral session, and it is hoped that all lovers of flowers will avail themselves of this opportunity of learning how to beautify their homes.

FOURTH DAY—FRIDAY, JANUARY 23d.

MORNING SESSION.

9 A. M.—Report of Entomologist, R. J. MENDENHALL.

10 A. M.—A paper on Grapes, N. J. STUBBS.

Grape report, from J. N. NORQUIST, of Red Wing.

Question Box.

AFTERNOON SESSION.

2 P. M.—Birds in Horticulture, by

E. E. HARRIS, of La Crescent.

Deferred Business.

EVENING SESSION.

7 P. M.—Forestry Session. Opening by PROF. S. H. FOLSOM. The Effects of Trees on Climate, and their Relation to Rainfall; followed by discussion on tree planting on the prairies; variety of timber; necessary legislation, etc.

Report of Committee on Final Resolutions.

During the session we expect addresses from Gov. L. F. Hubbard, Gen. Wm. G. Le Duc, and others; reports from Iowa and Wisconsin horticultural societies; also from several local societies.

We urge all members and friends to contribute to the exhibition, fruits, flowers, vegetables, woods, seeds, works of art, etc.

Liberal premiums will be awarded on all articles deemed worthy of merit.

The public are cordially invited to attend. For further information address President Truman M. Smith, St. Paul, or Committee on Arrangements and Program,

J. M. UNDERWOOD, Lake City,

J. S. HARRIS, La Crescent,

C. L. SMITH, 22 Bridge Square,
Minneapolis.

ANNUAL WINTER MEETING
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY
AND THE
MINNESOTA AMBER CANE ASSOCIATION.

HELD AT THE STATE CAPITOL, ST. PAUL, MINNESOTA, JAN.
20, 21, 22 AND 23, 1885.

The eighteenth annual meeting of the Minnesota State Horticultural Society and the eighth annual meeting of the Minnesota Amber Cane Association met in joint session, at room number sixteen at the capitol, at 11 o'clock A. M., Jan. 20, 1885, and was called to order by Hon. Truman M. Smith, president of the Horticultural Society.

Capt. Russell Blakeley, president of the Minnesota Amber Cane Association, made the address of welcome. He said:
Gentlemen of the Horticultural Society and Minnesota Amber Cane Association:

It is a matter of much gratification to me to have the opportunity of meeting you upon this occasion. It seems to be very fitting and proper that these two associations should have the

support and encouragement of the State legislature, and therefore very proper that those of us who are permitted to attend this gathering should meet at this time at the State capitol. That reason has induced the two associations to co-operate for this purpose. We also do it for another purpose. We hope during the present winter that some action may be taken towards providing a permanent home for the agricultural interests of the State, and hope that if this is accomplished the Horticultural Society and the Amber Cane Association may have a permanent place for holding their meetings. Some of us have taken no little degree of interest in regard to this matter and want to see the interests of these societies advanced, and we have grounds for hope and confidence of success in what we have attempted to do, and we expect to see established a permanent future home for these industries of the State. As a means to this end we have thought it desirable that these meetings be held here where members would be able to meet the representatives of their several localities, as well as those of other localities, and enable them to understand the true interests of these associations.

We hope this meeting will be one of interest and benefit to all, and may be of advantage to you and to those who come after you. I have no doubt, from my knowledge of the associations in the past, that we shall be enabled to accomplish something to aid us in taking and keeping the position we have attained as one of the most successful, notwithstanding our position geographically, for the products we represent, in the United States.

I hope, and feel assured, we shall have a report from our exhibit at New Orleans that will be most admirable and that will be a grand compliment to ourselves and these two associations, in common with the milling and grain-growing industries of the State; I trust and believe it will be a credit to us all. And in order that we may continue to advance and may be enabled to maintain our reputation as successful associations in the future, I trust we shall receive the assistance of the State which shall guarantee much more of success than anything which has heretofore been accomplished.

Gentlemen of the associations here represented, I have great pleasure in welcoming you to St. Paul.

President Smith announced that the secretary, Oliver Gibbs, Jr., was absent at New Orleans, and he would appoint S. D. Hillman, of Minneapolis, to act as secretary *pro tem.*, who had been engaged to report the proceedings of this session. It would be necessary to have an assistant secretary.

On motion of J. S. Harris, Cyrus L. Smith, of Minneapolis, was chosen assistant secretary.

Mr. J. S. Harris was called upon to respond to the address of Capt. Blakeley, and then came forward and said:

MR. PRESIDENT: In reply to the remarks of Capt. Blakeley I have only a word to say. When we received an invitation last winter, at our annual session, to hold our next annual meeting in St. Paul, we were rather glad, and to receive a welcome to the city of St. Paul makes us feel still better. We desired to meet you, the people of St. Paul and the people who represent our great State in the legislature at our meetings, in order that they might witness the course of action which we might take, the work which we are doing, in order that if they approved of it, and appreciated what we were doing, they might lend some State aid for the purpose of developing and enlarging our work.

The mission of the Horticultural Society, as you all know, is more than to develop fruit growing in the State of Minnesota. We say horticulture; what is horticulture? Horticulture is gardening—gardening of every kind; it is the planting of the forests upon our broad prairies; it is the planting of shade trees that adorn the streets of our cities; the planting of trees along the roadside, the planting of orchards and vineyards, the growing and harvesting of fruits, and more than that, it is attending the little and tender flower which shall make fragrant the poor man's cottage or adorn the costliest and most gorgeous green-house filled with its exotics, making the homes of the people of Minnesota happy and beautiful.

We have, during the eighteen years that the association has been in existence, accomplished something, and we feel encouraged at the work we have done thus far. We have aimed to lead people to inquire what they needed to do in order that they might raise orchards and gardens, fruits and flowers. Our society was organized in the city of Rochester, on the fourth of October, 1866, and it was a hard task to organize it. We called a meeting, at which there were some fifteen or twenty persons present, attending the State fair, and we started an association called the Minnesota Fruit Growers' Association. We organized and made efforts to encourage those present, as well as others, to do something to promote the planting of orchards and the growing of fruit. I remember that at the close of the meeting we prevailed upon twelve men to become members of the association. The next year we had another meeting, and it was by means of the

hardest work that we kept up our organization. We found that one or two had deserted us, but others took their place. From that time down to the present we have made a gradual advancement, and we have grown in numbers and influence. In the year 1873 we had become so strong and powerful an organization that at our annual session the members of the legislature came over in a body to see us, desired reports of our transactions, and provided for their publication and distribution by the State. From that time to the present our growth has been more rapid than ever.

We have met with many discouragements. Some of our winters have been so severe as to almost devastate our orchards entirely of trees, many varieties being killed entirely; and this has had a tendency to discourage all but the stout-hearted—all but those who were so enthusiastic as to be able to rise above the ruins of former efforts and again push bravely on. At the present time I think we number about three hundred members.

Three or four years since the legislature were satisfied we were doing a grand work, and the citizens of St. Paul and Minneapolis, welcoming us to their homes during our meetings and lending us every manner of encouragement, the legislature extended us a special favor and gave us an appropriation of \$1,000 annually, to help us carry on these meetings and make experiments in our work.

Gentlemen, we came to St. Paul for the purpose I have named, and again, we came for another purpose. St. Paul is the capital of our State; whatever we can do that will encourage the people of this beautiful and wealthy city, to beautify their homes, to make their surroundings more pleasant, we will do, and try to persuade you to make them so pleasant that those who come from the various parts of the State will see something which will be to them an object lesson, and which will please and accomplish good. We come to encourage you in doing that, and feel thankful that you have given us a cordial welcome to the city; we understand you welcome us to your homes and that we may behold all that is of interest about this beautiful city. And again I say we thank you, citizens of St. Paul, for the welcome extended to us to-day, and we hope we shall be able to do you, one and all, good, and that our conduct while among you may be such that you will be glad to invite us to come again.

Capt. Blakeley. I would say to those interested in the Amber Cane Association that Prof. Porter is expected to be here on the

noon train, and that I am not yet advised of the order of exercises that will be followed during the session, but this afternoon we shall be able to learn something more definite as to what has been done in this regard. Members of that association have no doubt received his circular. I would state here that Mr. Ingersoll and Mr. Fairchild, from the committee appointed with reference to fair grounds, would be glad to meet any present during the time they remain in the city, or at any other time, and consult with them in regard to that matter. They would be glad to arrange for a time when they could meet with us and explain what they are attempting to do. I hope we may reach a thorough understanding as to what is for the best with regard to our future home for these societies.

Mr. D. W. Ingersoll. I am very glad Capt. Blakeley has mentioned the subject, and we will be very glad to meet with you at any time and explain the matter.

President Smith. We are willing to dispense with the order of exercises of the Horticultural Society and allow you any time you may wish to devote to that subject.

Mr. Ingersoll. I think we had better not have the time announced at present, but we will arrange in regard to it.

The balance of the forenoon was devoted to the arrangement of exhibits and informal work, and a recess was taken till 2 o'clock P. M.

The room fitted up specially for the use of the society is No. 16, located on the third floor of the capitol building. The exhibition of fruits, of samples of amber-cane sugar and syrup, though not large, was attractive and contained many excellent specimens, especially of Minnesota apples, rendering the exhibit specially attractive and indicating very plainly that fruit growing may be carried on with success and profit in the Northwest.

Following is a partial list of the exhibits: J. H. Ackerman, Young America, Eumelan grapes; C. L. Smith, Minneapolis, White Star potatoes; Northrup, Braslau & Co., Minneapolis, large collection of field, garden and tree seeds; J. S. Harris, La Crescent, winter seedling apples for Lewis Lilley, La Crescent; James Wright, Minnesota City, seedling apples; Truman M. Smith, St. Paul, Isabella, Maxatawney, Catawba, Diana, Oporto and other varieties of the grape; Lewis Seutler, Carver, seedling grapes; A. W. Latham, Excelsior, M. Pierce, Minneapolis, and Peter M. Gideon, Excelsior, Wealthy apples; Knight Whipple, Northome, eight varieties of beans, two varieties of sweet corn,

three varieties of potatoes; J. J. Cale, three varieties of onions; H. F. Busse, Minneapolis, Beauty of Hebron potatoes, Hubbard squash, Red Weatherfield onions, White Globe and Yellow Danvers; Andrew Peterson, Waconia, Wealthy and Minnesota crab apples, Winstead Seedling, Seedling No. 4, plates of Russians, Lieby, Ostrakoff's Glass, Hibernial, Switzer, Imperial; Dr. C. W. Crary, Lake City, Perry Russet; J. M. Underwood, Scott's Winter, Wealthy, Malinda, Longfield, etc.; A. W. Sias, Rochester, for F. K. Phoenix, Delavan, Wis., three varieties seedlings, Centennial Russet, Hollister Sweet and Forest No. 1; for J. W. Hart, Hart's Seedling, with specimens of leaf, scion and wood; also Fameuse, Waldron's, Waldron's Sweet, Gen. Grant, Unnamed Seedling, Rollins Russet, Rollins Pippin, Wabasha, Elgin Beauty, Russians, Leipsic Barsdorf, Red Blush and Charlamoff, Hyslop; for A. J. Phillips, sweet seedling, sour seedling, Talman Sweet, Pewaukee, Walbridge, Golden Russet, and Willow Twig.

Following is the seed exhibit of Northrup, Braslan & Co., Minneapolis:

Beans—Dwarf Blackway, Dwarf Golden, Crystal, Ivory Pod, Improved Red Valentine, Long Yellow Six Weeks, China Red Eye, Dutch Case Knife Pole, Horticultural Pole, Large Lima.

Beets—Dark Red Egyptian, Dewing's Early Blood Turnip.

Cabbage—Premium Flat Dutch.

Cucumbers—Green Prolific, Improved White Spine.

Grass Seeds—Red Top, Timothy, Red Clover, Kentucky Blue Grass, Orchard Grass.

Lettuce—White Seeded Tennis Ball, Black Seeded Tennis Ball.

Water Melon—Mountain Sweet, Mountain Sprout, White Icing.

Musk Melon—Nutmeg.

Onions—Extra Early Red, White Portugal.

Peas—Northrup, Braslan & Co.'s First and Best, Yorkshire Hero, Little Gem, Premium Gem, Carter's Telephone, Prince of Wales, Black Eye Marrowfat.

Parsnip—Hollow Crown.

Pumpkin—Connecticut Field.

Tree Seed—Box Alder.

Turnip—Sweet German.

Tomato—Acme.

Squash—White Bush Scallop.

Wheat—Saskatchewan Fife.

AFTERNOON SESSION.

TUESDAY, Jan. 20, 1885.

The meeting was called to order at 2 o'clock P. M., pursuant to adjournment, by Capt. Blakeley, who stated that Prof. Porter had arrived from New Orleans, and it would be well, perhaps, to arrange as to the time to be given to the Amber Cane Association at the present session. There should be an understanding as to the time to be occupied; there was sufficient time for both societies, but there should be regular hours of work assigned to each. He simply desired to bring the matter up to ascertain what time the members of the Amber Cane Association desired to occupy. Prof. Porter was present and would make a statement.

Prof. E. D. Porter. When Secretary Gibbs approached me at New Orleans with reference to the best method of procedure of these societies, we did not know whether, considering the absence of so many of our members from the State, at the Exposition or elsewhere, that it would be worth while to undertake the holding of anything like a formal meeting on our part. He stated to me that circulars had been sent to all the members of the executive committee, and after waiting two or three weeks answers had been received from a majority of that committee endorsing a joint meeting, and also the idea of making these meetings informal. Of course the Amber Cane Association has made nothing like formal arrangements under the circumstances, and all we propose to do is to unite with the Horticultural Society in the discussion of matters of interest in common to both, asking for only a portion of the time, of course, for the transaction of the official business of the association, such as the reception of reports and election of officers for the ensuing year. I should think, perhaps, the forenoon of a day would be sufficient; but further arrangements might be deferred till after the morning session to-morrow, when more of our members will be here.

President Smith. I presume members of the Horticultural Society are ready to give way at any time you may desire. I hardly think there was a member who received a circular, in

regard to the matter, and no program was made out as I am informed. I asked Mr. Gibbs, when he spoke to me about it before he left for New Orleans, if he had consulted the executive committee, and he said he hadn't time, and if we wanted to consult them, we must do it ourselves, he didn't think there was any necessity of it.

Mr. J. S. Harris. I would say that I, for one, was opposed to the Horticultural Society and the Amber Cane Association meeting in joint convention without a program of exercises, not knowing what time was to be given to each, and without knowing anything about what was to be done. I did not believe anybody would want to come.

Mr. C. L. Smith. I asked Mr. Gibbs what was the arrangement, and he told me it was all arranged, and the program would be printed and sent out in a short time. I told him I thought the executive committee ought to be called together to make some arrangement. He said it would take too long, and he hadn't time to get the committee together, and if anyone had any suggestions to make in regard to the program, it could be altered. I waited three weeks and wrote him at New Orleans, to which I received no answer. I wrote him that no arrangements had been made for the winter meeting, and it was very important that something should be done.

Prof. Porter. I recollect a remark being made that Mr. Harris was opposed to it, but don't know that I recollect any other names. The statement was made that a majority, as he had been told, were in favor of a joint meeting.

Capt. Blakeley. I would like to inquire about how much time the Horticultural Society will want?

President Smith. We were to have a paper from Mrs. Underwood to-morrow morning, but there is nothing but what we can waive. We want the meeting harmonious, and if members will give us their views, we can, no doubt, arrange as to time desired.

Capt. Blakeley. Will we take 2 o'clock?

Prof. Porter. I suppose we could take the afternoon for business or any other matter that might come before the meeting.

Capt. Blakeley. Will it be desirable to have an address from the president of the association?

Col. J. H. Stevens. It seems to me that this is a matter which is fraught with much moment to the interests and industries of Minnesota. While we want to develope the interests of Horti-

culture, we want also to develop the interests of the amber cane industry. It has been seen proper to have the two societies meet in joint session; now, while I have not been consulted to any great extent in this matter, I certainly was consulted in the beginning, but I gave no opinion in relation to it. We are here and it seems to me that we can have both meetings held in such a way as to prove of interest to all, and in such a manner as to promote the interests of the State. I am sorry to see so few members of the Amber Cane Association here; I would like to see them come in and share the meeting with us.

Prof. Porter. Mr. Kenney is not here and others are absent at New Orleans. The world is very wide, and I hope we shall act in harmony and unite in our efforts to advance the industries in which we are so much interested.

Mr. Smith. We did not intend in getting out this program to consult the Amber Cane Association at all; it was understood when the program was arranged that it was to be varied or altered to suit the convenience of the members present and that we would be ready to divide the time with the Amber Cane Association and give way to them at any time except Thursday afternoon, but that we should hold to that part of the program. I simply mention the fact that there was no program made out, and I insisted on a meeting of the executive committee, and when they met they put out this program; they did so with the understanding that the Amber Cane Association should share in the exercises in such a way as might be agreed on here, and we are perfectly willing to give way to them and divide the time.

President Smith. I was afraid we would be unprepared and find ourselves in the same condition we were last year when there was an effort to divide the exercises with the Forestry Association, and the result was, neither one was prepared and we had to fill out the time as best we could.

Capt. Blakeley. I will say to the convention that I was aware of the condition of things. President Smith called upon me in regard to it and we discussed the matter of joint occupancy of time. It is for want of co-operation on the part of the two executive committees that the order of exercises has not been arranged. I have no doubt to-morrow afternoon will answer our purpose; and, at any rate, it will not take us very long to go through the regular order of our duties, and we shall probably not want to occupy more than the afternoon. If we find we are likely to entrench on our neighbors we may take a part of the

afternoon of Thursday, but I don't know as it will be necessary. With the understanding that we will occupy the time to-morrow afternoon we will, as far as the Amber Cane Association is concerned, dispense with further ceremony.

President Smith. It was the understanding when we made up the program that we were to share the time with the Amber Cane Association, and a motion to that effect will not be necessary.

Capt. Blakeley. I think there is no dissatisfaction anywhere.

Mr. Harris. I wish to make my statement a little plainer. I wrote to Mr. Gibbs and stated that I had very serious objections to having the two societies meet together, and calling the people to meet with us here at St. Paul without knowing what we were expected to do when we got here.

President Smith. We shall be glad to receive essays, and to learn all we can from the Amber Cane members, and get all the information that we can in regard to it. The first business at 2 o'clock, P. M., is the appointment of committees; there should be a Committee on Finance and one on exhibits.

I will appoint, as a Committee on Finance, Wyman Elliot, Minneapolis; J. M. Underwood, Lake City; E. H. S. Dartt, Owatonna.

I would like to have parties entirely disinterested to award premiums, and who will take into consideration our means and the value of the exhibits. Our society funds are not very plentiful, but we want all to share alike and in proportion.

Mr. Dartt. As it has been suggested by the chair that our funds are light, I would suggest that inasmuch as there have been no premiums promulgated that would be paid, those who have brought fruit have no doubt done so at their own suggestion, and not on the part of the society, to pay premiums.

President Smith. It is announced in our programs that liberal premiums will be awarded on all articles deemed worthy of merit.

Mr. Dartt. I didn't get the program, but I got the circular letter from the secretary, and understood that this was to be an informal meeting.

President Smith. It is better to economize in some other way, and where people have come from a distance and brought exhibits, they should receive premiums where they are deserving of it.

Mr. Dartt. I was going to remark that it should not be a

great disappointment if the premiums were rather light on coming together under such circumstances.

The president announced, as a Committee on Exhibitions, Wyman Elliot, Minneapolis; Isaac Gilpatrick, Minneapolis; E. C. Shannon, Granite Falls.

Committee on Final Resolutions : Col. J. H. Stevens, Prof. E. D. Porter, of Minneapolis, and J. S. Harris, of La Crescent.

President Smith. It has been suggested that a committee on legislation should be appointed; it remains with the society to say whether such a committee will be named or not.

Mr. Harris. Mr. President, it is my impression that we should always have such a committee; perhaps it should be a standing committee, with one to be elected annually. I think it should be elected.

President Smith. Why do you think we should have the committee elected with our officers?

Mr. Harris. We are likely to have something come before each session for such a committee to look after—we are liable to have before this meeting is through.

President Smith. This matter can be deferred until Thursday, when officers are elected, and if it is deemed best to have such committee, time will be given to select a good and competent one.

Capt. Blakeley. Mr. President, I would suggest that there be a by-law made providing for a legislative committee, if in order.

President Smith. The next order of business should be a partial report of standing fruit committees. Are there any reports to be made?

REPORTS OF FRUIT COMMITTEES.

J. S. Harris, of La Crescent, then made the following report :

OBSERVATIONS IN SOUTHERN MINNESOTA FOR 1884.

LA CRESCENT, MINN., Jan. 1, 1885.

To the President and Members of the State Horticultural Society:

Taken as a whole, the fruit crop of 1884 in this section was more satisfactory and better than in the two preceding years. The prospect at the opening of spring did not look as flattering as the spring of 1883, especially with apples and grapes. That

year was noted for the most profuse bloom we had ever seen; but between the effects of extreme cold from the previous winter, the killing frosts of May and a cold and backward summer, grapes failed to ripen, and the apples nearly all dropped from the trees before half grown. In 1884 the bloom was much less, but no killing frosts occurred after the fruit had set, and the season was more propitious.

STRAWBERRIES.

Taking the fruits in their order of ripening, we find that the strawberry crop was generally good, and the size and quality of the fruit the very best. They were about a week later in commencing to ripen than in some other years, and, as is usually the case under such circumstances, the season did not hold out as long as when they commence ripening earlier. Wherever beds of pure Wilson were found they gave a magnificent crop. Next to the Wilson, the Crescent Seedling is the most popular variety in cultivation here. The Charles Downing is not doing as well as when first introduced. It has become less fruitful, and the leaves are subject to a rust or blight. The Sharpless behaved better than usual, but is not hardy enough to become a favorite with the growers. Many other varieties are grown in limited quantities, but have not been under test long enough to make it safe to hazard an opinion of them. Observation leads me to remark that most of the strawberry plantations are managed on the run-at-will, go-as-you-please plan, and, as a general rule, are left without renewal until they are overrun with grass and weeds. Another objectionable practice that I have noticed is, making new plantations with plants taken from old, worn out beds. There are several serious objections to this practice. First, owing to tramping of ground and absence of cultivation, the plants are feeble and poorly rooted; second, they are liable to have become mixed with seedling and wild varieties; third, they are often infested with insects and their eggs, that will be transferred to the new bed with them. It would be good policy for every commercial strawberry grower to use for setting only plants taken from beds of the previous year's planting, or to annually make small plantations of the varieties desired, and cultivate them expressly for plants, or else purchase them from some one who makes the growing of plants a specialty. In the case of farmers, it is about equal to going without berries to set the surplus or thinnings of a neighbor's patch.

RASPBERRIES.

The interest in the growing of this valuable fruit has declined considerably in the last three or four years. Old plantations have run out and but few new ones are being made, and the markets are largely supplied from the hedge-rows and by importations. Wherever cared for, the Doolittle Black Cap was fine and productive. The Turner is most extensively cultivated of the red, and produced a bountiful crop of rather small berries. The Cuthbert is promising well, and, should it prove hardy enough, will supersede other varieties. The fruit is of large size, carries well, and is inferior only to the Turner in flavor.

Blackberries gave promise of a fine crop up to the middle of July, when, except where winter protection had been given, and upon northern slopes where the snow laid deep, the beft of the crop blighted and dried up—the probable cause, loss of vitality in the fruiting canes from the severe cold of last winter. It is evident that to be sure of a good crop every year some protection must be given our most hardy varieties.

GRAPES.

Grapes in this district and in most parts of the State were an extraordinary crop, except in a few instances where they were affected with mildew or rot. There were no killing frosts in May to cut back the young growth, and no heavy storms of rain while they were in blossom, to destroy the pollen and prevent the setting of fruit, and the frosts held off so late in the fall that the entire crop matured. The yield was good, the berries and clusters large, and the quality superior.

The leading variety in cultivation has been the Concord; next to that stands the Delaware. The Worden, upon my place, was better than any other variety, and three or four days earlier than the Concord. The Janesville is valuable as an early grape, and very good if allowed to hang until thoroughly ripe. There is some cause for alarm on account of the appearance of the rot to which I have alluded. Its appearance was first noted last fall, and as we have heretofore been exempt from it I have never given the subject any attention, and do not understand the cause of the malady or any remedy for it. My attention was first called to it by a paragraph in a La Crosse paper stating that the Concord grapes in the vineyard of N. Hintgen had been stung

by some unknown insect which had caused the loss of several hundred pounds. I immediately made the vineyard a visit and found the grapes badly affected with what I concluded to be the American grape rot, a fungus disease that has been very destructive in the vineyards of New Jersey and other parts of the East.

The berry at the time was nearly or quite full grown, and the disease appeared in various stages of development and in places the ground was literally covered with berries that had fallen from the stems. I discovered that when first affected they showed only a small whitish speck upon one side, smaller than the head of a pin. This white speck is soon surrounded with a brownish areolea shading off in concentric rings which extend their surface until one-half of the berry is implicated. At this stage the whole structure of the berry is disorganized, the rings disappear and the color changes from a reddish brown to a brownish black, and it ultimately drops from the cluster, or if it remains becomes a little, dried up, rotten grape. In no case do the affected berries recover and ripen. Later I learned that several vineyards in this State were alike affected but in a less degree. Should another season show a return or increase of the malady, an important field will be opened for scientific investigation and experiment.

APPLES.

The apple crop was generally fair and in some sections large. The exhibits made at the State and other fairs, surpassed all previous years. The injury by the codling moth was not as great as usual; but a more to be dreaded, because more difficult to head off pest, has made its appearance. I refer to the apple gouger, or curculio. The past season, by its work, hundreds of bushels of Duchess apples were rendered worthless and other varieties were more or less injured, probably the Willow Twig the worst. Borers, tent caterpillars, canker worms, scab blight and mildew are already ravaging the older orchards of the State, and tell us in the plainest of language that "eternal vigilance" is to be the price of fruit.

Gentlemen, the situation is alarming, but not past help. The time has come when we need the co-operation and help of a host of close observing, energetic men; men who have soul enough in them to work for the good of mankind and the glory of our great State instead of notoriety and the "almighty dollar."

The time has arrived when our honorable legislature should provide for the employing of a State Entomologist and Microscopist, and the conducting of horticultural experimental stations, or increase the appropriation to this society to enable it to prosecute the work.

JOHN S. HARRIS.

DISCUSSION.

Mr. Harris. I want to show the society the work of that insect or little animal referred to in the paper. This is a Willow Twig apple and it is a fair specimen of the work that these fellows have done. Those conversant with the Willow Twig know that it is a pretty large apple, but this one is a rather gnarly specimen. Here is a Walbridge. I was going to state that in our vicinity hardly one barrel in ten of the Duchess was fit to go to market. I know some of our old orchardists, whose names I need not mention, have had to dry their fruit. The insect stings the fruit and does the mischief in that way. About one-fourth of our fruit crop was in that condition last season. I have been trying to find a man who could give us a paper and tell us of a remedy; I have not yet found him but hope I may. The insect seems to do the mischief about the time strawberries are ripe, and not at the time the apples are in blossom. One of our members caught them at it at the time we had our June meeting last year.

Capt. Blakeley. I have been very much interested in the report of your committee, especially with regard to the report of the rotting of the grape, noticed at the vineyard near La Crosse. I think it is about the first occasion I now call to mind that has been reported in this vicinity or in this State. I would like to ask if he is quite positive it is the rot or something similar to it, whether there was any inspection by other persons also who were competent to offer an opinion in respect to it. I should hate very much to have a report go out from this association that rot was in our grape fruit in this vicinity. I should like to know whether it might not be possible that it was something else. Of course I am not competent to inspect fruit, but I know that there are others here who are and who are probably able to give us some opinion, contradictory, perhaps; others who have had experience in grape culture.

Mr. Harris. I should hope that somebody could contradict this and show it is not a rot, for I should hate very much to have

that go out if it is not the fact. I would say that the grape looked very much as I saw it the previous season in Ohio, on the Catawba, and they told me that was the grape rot. It comes on at first in little spots about the size of a pin head, and after that rings form which show very distinctly for a day or two and after that it looks very much like a sunburnt fruit, and the grape soon drops off. A Mr. Hartman, of Houston County, told me that they lost at least one-third of theirs, and I understood that they had the same thing at Brownsville.

Mr. Underwood. I would like to ask whether it is likely to attack one variety more than another?

Mr. Harris. I think it is likely to attack the Catawba first and the Concord next.

Mr. Underwood. I am not quite certain as to what it is; but it has affected the Janesville, and that is the first I ever saw of it. I spent considerable time in looking at works on grape culture to see if I could find something that would exactly describe it, so that I could get a correct diagnosis of the trouble in hand, but did not find anything that would satisfy me exactly as to what was the matter; but it was very closely allied to what you have described, that is, commencing with a little spot and working in a circle. I don't think in the first place on our grapes it was larger than half a ten-cent piece. That was perhaps in the most aggravated cases. Only that one variety was attacked with us this year.

Mr. Harris. I was not on any plantations where they were growing the Janesville.

Mr. P. M. Gideon. Two or three of ours were entirely swept out by it, but the Janesville came out the best of all.

Mr. M. Pearce. Did that resemble the sunburn, or was it rot?

Mr. Harris. It resembles a sunburn.

Mr. Pearce. I don't know, I had it on Rodgers' No. 4; there were a few grapes affected on a bunch and the rest would be free from it. I looked at it a good deal and studied the matter over, and concluded it was a sunburn, and then concluded it was not. I noticed it was on Rodgers' No. 4, but it was not very bad. I found the other grapes were not affected. It didn't seem to be a contagion. It seems to me to be something like what I would call a sunburn. It was something new to me and I didn't know that anyone else had it, and didn't know that that variety was a subject to something of that kind; but it was seldom that a whole bunch was affected.

Mr. C. E. Shannon. Two years ago my grapes were affected; the past year I saw but very little symptoms of it. It seems to me it must be owing to the difference in the climate this year. I had a few on the Elvira and a white grape, and some of the Janesville, that showed signs of it, but my grapes were much better than for the previous season.

Mr. Harris. If it was the rot it would be worse some seasons than others.

Mr. Pearce. I don't think it was the rot. From what I saw I do not believe it is that.

Mr. Harris. The grapes dry up and turn black, and are worthless.

Mr. Pearce. They would not ripen; they hardened up.

Mr. Underwood. That hardening up is something that they have on the Rodgers every year, but it is entirely different from the rot; this rot is another thing. We never saw this on our vines until this past season. It destroyed three-fourths of our grapes. I didn't know of it until the most of the injury was done; it was done before I discovered it.

Mr. Latham. I know nothing of the rot. I had a little of this trouble with the Ionia and the Brighton, but not as it has been described. I can understand how Mr. Pearce should be led to think he had the rot in his grapes, but I think it was the sunburn, because where the fruit is grown in the shade, and by some accident the shade is withdrawn, the fruit will put on this appearance; and it ruins the fruit. I have occasionally had a bunch injured in that way by being sunburnt, but have never seen any rot.

Mr. A. W. Sias. We have a variety we call the Hardy Connecticut; they are a good bearer, but about every other year they are completely ruined by this same thing, whatever it is. We have had the grape destroyed in some places where it was completely in the shade. I don't think it could be from the effects of the sun. Some years the fruit is good, and then, perhaps, the next year they would be ruined entirely. This is the only variety we have that is affected very much in this manner.

Mr. Smith. I would like to know of Mr. Shannon, who lives at Granite Falls, on what kind of ground his grapes grew that were affected.

Mr. Shannon. I noticed where the grapes were the most affected the vines were on ground that was extremely dry. It was protected from wind, so that sometimes it got pretty hot, and it may have been, as a gentleman over there suggests, sun-scald.

Mr. Latham. I think not, unless it was where they were exposed after the fruit was pretty well along. I suppose it is understood that heat scalds and ruins the berry.

Mr. Shannon. On the other ground there was no signs of it.

Mr. Wyman Elliot. I would like to inquire of Mr. Harris whether he detected any signs of mildew on those vines?

Mr. Harris. I saw mildew in Mr. Hintgen's vineyard; it don't affect any other varieties except the Concord; I have also seen mildew on Mr. Sias' vines.

Mr. Underwood. Mr. President, it seems to me it is mere matter of speculation to us here now as to what it is, and I want to say that in observing our fruit that was affected, my experience was that it was more like the sting of an insect or something that had affected the grape at that point and perhaps destroyed the circulation, and which worked in such a way seemingly as if something had poisoned it and killed it; the rest of the crop around it would seem to be all right and in good condition and I look at it that if we could just cut that little scald off and heal it over it would be all right again. Of course I am not offering this as any correct solution of the problem and wouldn't have mentioned it only that I didn't see that anyone else was giving any positive explanation in regard to it. It is barely possible that it is the effect of an insect.

President Smith. I am inclined to think it is the effect of an insect.

Capt. Blakeley. I would like to know of our president whether he has seen this in his experience?

President Smith. I have lost very few grapes in that way, but from what I have seen of it am inclined to think it is the work of an insect and not rot. It is something similar in appearance but I feel almost sure it is from the effects of an insect.

Mr. Harris. Well, I examined a number of grapes by means of the best microscope I could get and I could not discover anything of an insect there. It seemed to be something that had grown and corroded. Mr. Hintgen said no one could convince him that it was anything else but the rot. I brought this matter in as a sort of suggestion to our grape growers; it may be necessary for us to take stringent measures to arrest its progress.

Prof. Porter. I would suggest that each member resolve to carefully observe and to faithfully record and report the facts at our next meeting. I don't think that we are prepared to draw any conclusion in regard to it now.

Capt. Blakeley. I was very much pleased with the paper read, but I should deprecate very much a report from this association that should go abroad to the effect that we had the rot in our grapes. While I don't intend to make any motion in regard to that part of the report of Mr. Harris, I simply make the suggestion whether or no he would not himself, from the expression of opinion and sentiment of those present who have spoken, perhaps amend his report that he had found grapes destroyed either by some insect or by some unknown cause, describing the appearance and character of it; I should hate to have our reports say that we had the "rot" in our grapes.

*Mr. Smith. I have seen something of this and have watched the discussion with interest, as I have known something of the circumstances attending it, and I am of the opinion that where the vines were perfectly healthy the grapes were not affected. That is my conclusion. I think that Mr. Shannon's idea is about right, that where it was driest there they were hurt the worst. Mr. Latham didn't have any of it and he is located near the lake and close to the water. At the foot of the hill on Mr. Shannon's grounds there was plenty of moisture and there he didn't have any of it. I don't know as to the others, but on the grounds of Mr. Underwood there is plenty of chance for it to get too hot. I think the trouble is due to unhealthiness of the vines rather than to any disease.

Col. Stevens. Mr. President, I am happy to announce that Mr. A. G. Tuttle of Baraboo, Wis., is present, whose name is a household word among horticulturalists. I move that he be invited to a seat with us and to act in the deliberations of this association.

The motion was carried.

President Smith. Mr. Tuttle, will you please come forward. I will say to the members of our society that Mr Tuttle has met with us before and I am very glad to have him meet with us again, and I know we can all profit by his instruction.

Mr. Tuttle. Mr. President, it is a good many years since I met this association; I believe its session was then being held at this place, and I think during the winter of 1872 and 1873. You were then undergoing a change in your horticultural ideas from the effects of that winter or immediately afterwards. I know at that time you were recommending varieties of the apple that we could not indorse down in Wisconsin.

* Where Mr. Smith's name appears without the initials being given, reference is had to Mr. C. L. Smith, and not to President T. M. Smith.

President Smith announced that a change would be made in the program, and that Col. Stevens would now read his paper on the subject of "Ginseng."

CULTIVATION OF GINSENG.

BY COL. J. H. STEVENS.

MR. PRESIDENT: In common with all of the members of the society, I am much interested in all matters that appertain to the horticultural interests of the state. That the efforts of the society have been fraught with great moment for the weal of all classes of our citizens cannot for a moment be doubted. There is one product incident to a portion of our soil and climate that has never, as far as I know, received any consideration from our deliberations. I refer to the cultivation of ginseng. I do not hesitate to say, for one, that however insignificant this little plant may appear in the minds of our members, that I can never forget the dark days that immediately followed the financial troubles of 1857, when by the gathering of the roots in the big woods, of this native product, the families of hundreds of farmers in our state were saved from actual want of bread. It was a god-send to them, and a rich harvest to the merchants and traders of that period. In short it was about the only article of export we had, that would bring the hard cash. The woods were full of it. One house in the adjoining city of Minneapolis, that of Mr. Godfrey Schielting, paid to the small retail dealers in the country some \$50,000 per annum for two or three years for this article. Other houses in St. Paul, Shakopee, Mankato, St. Peter, Faribault, and other places of trade, probably paid out more money each year for this product than the Minneapolis house did. Being intimately connected with the farmers then, I know of the great value it was to them; hence my partiality and kind remembrance of the service it was to the people at that time.

After our annual meeting last winter I saw, for the first time in many years, an almost life-long friend, Isaac Marks, of Mankato. I knew him when we were boys in the lower county, and many of you will remember him as an honest merchant years ago on the banks of the Upper Mississippi. I was much surprised when Mr. Marks informed me that his purchases of ginseng, the present product of Minnesota, amounted annually to considerable sums. It would appear by this fact, so to speak,

that it reproduces itself, because it was claimed that it was all gathered during the years of the hard times.

In June of the past year the department of State at Washington addressed inquiries to the ministers and consuls of the countries where ginseng is used, to ascertain its general market value and the principal use made of it, and other facts bearing upon the article:

1st. As to the supply and demand.

2d. The difference between the cultivated and wild roots—as to market value and demand.

3d. How the demand for the wild American roots compares with the wild native roots.

The answers were very voluminous, and from them we learn that in China there are various kinds used, viz., the Korean, Japanese, American and native. The native is said to be imperial property, and is sold to faithful subjects, who are willing to pay almost its weight in gold for a remedy believed to have great virtue.

It seems hard to determine the specific use of ginseng in China.

Ginseng is divided into two classes, clarified and crude. The former is rendered translucent by steaming, skinning and drying the fresh roots; the latter is the natural dried root. The roots are about the size and length of a man's little finger, and when chewed have a mucilaginous sweetness. If good they will snap when broken. Dr. Smith, in his work on Chinese materia medica, says:

“The trade in this drug is a specialty. Great care is required to preserve choice specimens from the effects of damp and the attacks of worms, to which it is liable. This drug is prepared as an extract, as a decoction, in silver vessels as a rule. Its effects are apparently those of an alterative tonic stimulant, carminative and demulcent character, with a few exceptions, but with many reservations as to the stage of the disease in which it may be administered with the greatest benefit and safety.”

In 1882 there was imported into China from foreign countries 4,731.27 piculs (133½ pounds to the picul). In 1883, 3,499.38 piculs. American ginseng sells in China at from \$2 to \$5 per catty (1½ pounds).

American ginseng is principally, if not entirely, shipped to Hong Kong. The import of crude and clarified root from 1860 to 1883 inclusive amounted to about 10,021,000 pounds, or the average of about 417,500 pounds per annum. Half of this comes

direct to native importers and others through agents in New York and San Francisco, and the other half to an American firm from Western America. The root is sorted previous to shipment to China, and comprises various grades, differing from each other in value from \$50 to \$100 per picul. The average price for crude (which forms the bulk of shipments), according to the following classifications, are: Superior, large selected root, \$450; large and selected, \$380; good ordinary, \$300; medium good, \$270; fair, \$250.

Some very choice large roots have brought \$600 to \$700, and "extra choicest selected large and heavy" sometimes commands fancy prices, up to \$1,000 per picul.

Few persons appear to know about it more than that the root is largely used in the empire as a stomachic or tonic, but, singularly enough, its value seems largely to depend, in the minds of the people, more upon the radix than upon its inherent qualities.

The name "ginseng," I am told by Chinese scholars, signifies the "Man Plant," on account of the shape of the root, which is bifurcated, somewhat resembling the thighs and legs of a man. The nearer the peculiar form approaches to perfection of resemblance to the human frame, the greater the value. I am reliably informed of one single root, weighing not over three pounds (two catties) that was sold for about \$1,500 in gold. Of course its intrinsic value could not have been greatly different from other roots of the species, but its shape was esteemed to be very perfect.

The use of the root is universal throughout the empire. Nearly every drug store of the natives has displayed upon the door posts the announcement that "ginseng and young deers' horns pills" are an article of ready supply. The latter component is also esteemed valuable as tonic, and two combined are a *sine qua non*. They are first reduced to powder, and then mixed in the required proportions. The ginseng is believed to have special effect in strengthening the genital organs, and this idea alone would give it great value in the opinion of the Chinese, as well as the other nations of the East. The faith in it is universal among them, whatever the fact may be; and the highest mandarins, as well as the coolies, use it.

I gather the above, in relation to its use in China, principally from a reliable Eastern paper.

And now what I wish to call the attention of the society to:

Can ginseng be cultivated? I am well aware that there is a common opinion that it cannot; that it has a spontaneous growth in certain soils in the forests of the continent; but it appears to me to be an erroneous opinion. It is so opposite to the experience in everything else belonging to the vegetable kingdom that I am rather inclined to think that the experiment has never been made. My conclusions are, if it could be successfully cultivated, that the profits in raising it, in favorable localities in Minnesota, as well as in other Western states, would be very great. I ask the society if any of its members have any experience in regard to the habits of this plant? If properly considered, and the necessary experiments made, there might be a possibility we could add an important diversity to our home products. As an article of export there would be no danger but what it would command a high price in the commercial world. Several thousands of dollars' worth could be raised on an acre, provided it could be made to grow as well in a cultivated state as it does in a wild one.

DISCUSSION.

President Smith. You have heard the essay; remarks are now in order.

Col. Stevens. My attention was called to this by some friends of mine living in Carver County, and it was requested that it should be brought before the meeting at this time.

Mr. Smith. Mr. President, in view of the fact, as I suppose, that very few of the members of the horticultural society are very well posted on ginseng, I would move the appointment of a committee of three, whose duty it will be to inquire into this subject, as to the cultivation of it, and make experiments during the ensuing year, and report at our next meeting. I think that is the best we can do in regard to it.

Mr. Whipple. Mr. President, I think there are some members present that have had some experience. I believe there are several here that have lived in the "backwoods," and I for one have lived for thirty years on the products of ginseng to some extent. I came to Northome in the year 1857, and that was about all we had to live on in those days. We dug the "sang" for a living, and we made good wages at it. I have dug more or less nearly every year until within two or three years, and have taken as high as \$6 a day for digging; but at that time the dry

sang brought \$1 a pound. In 1883 dry sang was \$1.80; this year it was from \$1.40 to \$1.60. As far as cultivating it is concerned, I have experimented some on that. I would say that it can be propagated, but not cultivated. You can gather the seed and sow it in its native bed, that is, in the forest among maple timber, and propagate it, but you must have a fence that a deer cannot jump over to keep the sang diggers out of it, or you will not have any proceeds. You can take a full grown root of the sang and set it out in a cultivated bed in the sun, and inside of one month it will have gone to seed—that is, the leaf will be dead and the root and everything will be dried up. You cannot cultivate it in the sun; that is my experience.

Mr. Smith. Does it seed pretty well?

Mr. Whipple. Well, not very well; and at the present time it is hard to find stalks old enough to have seed.

Mr. Smith. Do you know how old it has to be to have seed? Is it a perennial or annual?

Mr. Whipple. It begins to seed when two or three years old, but the most of it is dug out at the present time the first or second year from the seed.

Mr. Peterson, of Waconia. In 1858 I planted a handful of ginseng in a bed, and I have dug a good deal of it in the woods, but if it is not shaded it will not grow. I think myself that it should be cultivated, and that ought to be done in the woods, not where the woods are too thick. May be it could be raised there but not out in the open field.

Capt. Blakeley. I would like to ask Mr. Whipple what character of timber he gathered sang among in the Big Woods and on what kind of soil?

Mr. Whipple. Well, on a clay soil; generally maple and oak is the best.

Mr. Peterson. Where it is maple it is generally the best.

Mr. Charles Kenning, of Bird Island. Mr. President, in 1857 I experimented somewhat. I tried to propagate by root plants and by seed in a garden patch but did not succeed. In the woods I could raise scraggy ginseng, but never could as a native plant in a bed, and I soon quit it altogether. Us boys, at that time, were allowed the proceeds of our digging. We tried to propagate it and failed, and I doubt if we can raise the root at all by field culture.

Mr. Smith. It is possible that we could if we were to try it in the right way. You cannot raise the fir, the pine and the spruce

by seeds in the open ground, and yet thousands of them are raised all over the country. It is possible that if experiments were conducted aright we might have success with ginseng just as we have with spruce and pine. They germinate in the shade but we succeed in growing the trees with cultivation.

Mr. Tuttle. You have to keep the spruce and pine in the shade the first two years.

Col. Stevens. The ginseng seems to reproduce itself after the roots are all dug up.

Mr. Whipple. I know we have dug sang for years on the same grounds. The shoot comes up with one stalk and one bunch of leaves on it. You will often find that where the person has dug and thrown back the dirt you will find there three to half a dozen of those young shoots coming up the next year.

Col. Stevens. Let me say that I am acquainted with a responsible party, who lives in the Big Woods, who told me that if the society could plan some way in which it could be propagated that he could make ten thousand dollars off every acre of land that he had.

Mr. Whipple. I don't doubt it. But I fail to find any way that you can propagate it to pay.

Mr. Smith. Perhaps we had better refer it to our experimental farm, to our friend Prof. Porter.

Mr. Whipple. I don't think he has woods enough there to shade it good.

Mr. Ackerman. How long does it require for the roots to perfect themselves, to attain their growth?

Mr. Whipple. That I cannot answer.

Mr. Gideon. They don't appear to ever stop growing.

Mr. Whipple. You will find that every shoot has a prong or sort of a jog to it, and I have known them to have twelve to fifteen jogs on one stalk. You can tell by that how old the roots are. I don't know how much older they get; you count these and tell the number of years' growth. These shoots will rot off and leave new roots.

Col. Stevens. I will second the motion of Mr. Smith with the understanding that there shall be something found out if there can be.

The motion for the appointment of a committee to report on the subject under consideration at the next meeting, was carried. The president appointed as such committee: C. L. Smith, Col. J. H. Stevens and Prof. E. D. Porter.

Capt. Blakeley. If there is no other business before the society I would like to have Mr. Ingersoll appear before the society. He is chairman of the Committee on Fair Grounds from the St. Paul Chamber of Commerce; he would be glad to know if this society would like to confer with this committee in regard to the matter. If he is present he can come forward and explain what is desired to be done. It would not take very much time, and perhaps to-morrow afternoon could be taken for the purpose.

Mr. Ingersoll. Mr. President and Gentlemen, I don't desire to take up much of your time except to state that our committee would like to meet you and state what has been done and the attitude of St. Paul towards a union fair ground, or fair grounds, that will accommodate the entire State, placing them at a point that may prove most accessible by railroad and other means of access, and the most accessible that can be selected. The committee were appointed at the suggestion of people connected very closely with the State Agricultural Society. St. Paul is in most hearty sympathy with the movement to have fair grounds selected which will be accessible and accommodate the people of the whole State for all future years, and it is for you, gentlemen, to say whether you desire to take any action. We would be very glad to come before you and state what can be done.

President Smith. So far as the Horticultural Society is concerned, and Capt. Blakeley can speak for the Amber Cane Association, we will grant you any time most convenient to you.

Mr. Ingersoll. Say sometime then to-morrow.

Mr. Elliot. Wouldn't it be well to put this off till, say Thursday afternoon.

Capt. Blakeley. It will be at the will of the convention.

Mr. Harris. Probably there will be more here then.

President Smith. Suppose we put it Thursday at ten o'clock.

Mr. Ingersoll. Very well; that will give me ample time to see the committee.

Prof. Porter. Mr. Chairman, I would make a motion covering the suggestion of Mr. Ingersoll, that on Thursday morning at ten o'clock the joint societies, the Horticultural Society and Amber Cane Association, will hear any statement bearing upon the proposed union fair grounds from committees of either St. Paul or Minneapolis; either or both.

The motion was seconded and carried unanimously.

Mr. Harris. Mr. Cutler, of Sumter, is down for a paper on strawberries and small fruits. Before our meeting adjourns we

may get a paper from him. I have received a letter from him and an abstract from it may serve to bring the question before the meeting in case his paper should arrive too late. He states in his letter that he had a fair crop of berries last year, most of them the Crescents; the Sharpless yielded very few berries. He says: "At a meeting of the McLeod County Institute I gave a paper upon the growing of small fruits and in that paper stated that the Sharpless would probably 'peter' out, and they have turned out about as I predicted, for I had very few berries. I have several new kinds; got several new varieties last year. I have fifty vines that produced 5,000 plants; the Phillips is a very nice berry; set fifty plants last spring; set out some of Stone's hardy blackberries last spring and was well pleased with the bushes, but as I did not cover them I am afraid that forty-five degrees below zero has fixed them. Have set about one acre of Turner raspberry, so you see I am not idle." He wishes us an interesting meeting and a profitable time. Mr. Cutler has been up in that country some ten or twelve years. He has been trying to raise strawberries and two or three years ago he thought it a good idea to come down and attend the meeting of the State Horticultural Society. It was after listening to the discussions and hearing the reports that he carried home this information with him that he has been successful in getting some berries from his plants. Previous to that his efforts had proven a total failure, only loss of time and money, but he has succeeded so well that he is now setting out two acres and has quite a piece started. So we see, gentlemen, our society is doing a little good; we are planting some leaven that is working.

Prof. Porter. To-morrow afternoon has been assigned for the meeting of the Amber Cane Association. I will state that after the opening address, which will be delivered by the president, Capt. Blakeley of St. Paul, that I will make a statement of the condition of the industry of Minnesota sugar and syrup at the New Orleans Exposition, and a comparison of the sugar products of Louisiana and Minnesota.

President Smith announced as the next in order a paper entitled:

NOTES FROM A FRUIT GARDEN.

BY W. H. BRIMHALL, OF ST. PAUL.

The paper, by request of Mr. Brimhall, was read by the assistant secretary, Mr. Smith.

Mr. President and Members:

Being a new beginner in small fruit-growing, I can give you nothing of much interest. When I came on my place in the spring of 1882, it was covered with hazel brush and scrub oak. Being anxious to raise strawberry plants for the next year's planting, I broke up a small patch, two by five rods, about the twentieth of May and set it out to Crescent Seedling, Charles Downing and Wilson, setting them two feet apart in the rows and the rows four feet apart. They did not run very much; the plants were small and the crop did not last two weeks; they seemed to dry up or blight.

I set from that bed 1,500 Crescent Seedling, 1,500 Charles Downing and 500 Wilson on land in fine condition, giving all the same care in summer, and covered with marsh hay. All came out nice in the spring, the Crescent having made the largest number of plants. The Charles Downing were a failure, there not being enough fruit to pay for picking, while from the Crescent and Wilson I picked six hundred and fifty quarts of nice berries. I mulched a part of the bed and found that it doubled the yield. The berries were larger and lasted a week after they were all gone from the part not mulched. For mulching I used straw from an old stack bottom. Have tried early and late planting and find that plants set early are less liable to dry out, make a larger growth of vines, and yield more fruit. I set last spring mostly of Crescent and Wilson, setting three rows of Crescent and one of Wilson. I also set some Glendale and Iron Clad. All made a nice growth and looked well when covered. The Iron Clad made the largest growth of all, completely covering the ground with strong, healthy looking plants. Have noticed the leaf-roller the past season. It seems to work on the Crescent mostly. Have not seen any on new beds.

For raspberries I have set Turners mostly. Set as early as the land will work well, in rows north and south, six feet apart, and three feet apart in the row, using the little green shoots just

as they come through the ground, being careful to take up plenty of roots with them. Keep well cultivated the first season and mulch heavy in the fall with old hay or straw. Gooseberries and currants I tend the same way, and all bore well for young bushes. I set Red Dutch currants and American Seedling gooseberry. The gooseberries mildewed badly.

My grapes set on a southern slope two years ago last spring; most all killed out, leaving but twenty out of one hundred and forty. They were cut back and covered with earth in the fall, and covered early, the only live vines being in the hollow at the ends of the rows where the snow blew in. They were Delaware and Concord mostly.

DISCUSSION.

Mr. Shannon. I would like to ask what is the most approved material for covering strawberry vines in the winter?

Mr. Smith. Mr. Brimhall has answered that question, and he says it is marsh hay. Now, I have traveled about a good deal in Minneapolis and St. Paul, and other places, looking at strawberry beds, and I like the plan of Mr. Brimhall in the way he protects his strawberry plants, and think it is about the best of anything that I have seen anywhere, and he uses and recommends the use of marsh hay. I like his plan also of setting the young shoots of the raspberry and cultivating them well the first season, and afterwards mulching the land and putting it up close to the raspberries. I think I would add a trellis which I would put along by the side of the canes and I would put some corn stalks over them for a protection in the winter. Mr. Harris refers to something similar. A very small handful of marsh hay, if tied up around the canes and covering them a little, will protect them perfectly during the winter.

Col. Stevens. Will not tame hay do as well as marsh hay?

Mr. Smith. No, sir, there is too much danger of the seed scattering in the soil, and in this country we can get plenty of slough grass.

Col. Stevens. I would like to inquire about the use of corn stalks; I know it is a good thing, but I have my doubts whether it is quite as good as coarse manure or hay and straw, which I think the best thing that can be used for strawberries. The best crop of strawberries I ever saw grown I think was on Mr. Wyman Elliot's place, and the mulching used was corn stalks.

Mr. Elliot. The objection to corn stalks is they are a little too coarse. Where a covering is used for the plants that are exposed the best thing is coarse marsh hay. It is very fortunate for us that we have plenty of lakes all over this country, and most of us can get an abundance of marsh hay.

Mr. Whipple. Has there anything been found better than marsh hay for raspberries?

Mr. Smith. I think Mr. Whipple has found something better. The two societies have come together at this session and what the Amber Cane Association has left the horticulturalists may take for their mulching. [Laughter.] Mr. Whipple uses the sorghum bagasse among his raspberries, and I noticed that last season he was selling the berries about a month after the rest of his neighbors got through, and they were the best in the market at that.

Mr. Whipple. I have a patch of raspberries that I have fruited for nine years, and during the past seven years I have done scarcely anything to them except to mulch them a little with this bagasse.

President Smith. I won't attempt to say how many quarts of berries I raised on a single acre; but I had a party who picked one hundred and four quarts in a day from the patch, so you may judge they were pretty thick. And they were mulched with saw dust.

Mr. Whipple. A good deal depends on how full one fills their baskets when they are picking.

Mr. Tuttle. Mr. President, I have tried various things for covering strawberries; we used to use marsh hay, but a few years ago I had a plantation of strawberries and I had a heavy crop of corn and so heavy that I did not cut it all up, so after I had taken out the corn I took the stalks to cover my strawberries. I grew that year and had one-third of an acre of the Crescent; I grew one hundred bushels from that third of an acre. I found that mulching—I only mulched once; I spread the stalks out evenly and I let them remain and didn't attempt to take the stalks off. You will find that the plants will crawl up through them. The first that I mulched I took off a part of the stalks; but I was away for a few days and when I came back to take off the balance I found the vines were growing up through the stalks and I left them. The result was the berries were very much better where the stalks were left on the vines, and ever since that I have used corn stalks for mulching. It makes a good protection against the severe freezes, and it keeps your berries back in the spring.

The difficulty with marsh hay is that you are obliged to remove it; it is necessary to remove it in the spring, but it is not necessary to remove corn stalks. I only grow two crops of strawberries. The first year I cultivate the vines thoroughly, and then mulch them well in the fall and that is the last I do to them; I get two crops. The old stalks that were first put on by the second year become partially rotten, and furnish a good mulching for the next year.

Mr. Pearce. Mr. President, I think the subject of mulching strawberries is one of importance to all strawberry growers, but with me it has been a query when it should be done; from my own experience and what I have observed I believe that it is a better time to mulch when the snow is on the ground. I have had the best success, and the best crop of berries I ever raised, mulched a little before Christmas with straw, and after the snow was on the ground; the straw kept the snow from melting, and kept it on the vines for weeks; they certainly were the best vines I ever grew and came out very vigorous. If it was not such an inconvenience to get around on the snow I think I would adopt that plan. The great trouble is you are apt to get the mulching on too thick, so that the vines will smother. I don't know from the experience I have had if we happen to have snow along towards Christmas that I would mulch any other way; I don't think the strawberries are killed in the winter; it is in the spring they are killed. I am speaking of my experience; my success has been in mulching on the snow. Where straw, marsh hay or anything of that kind is used there is likely to be a good deal of grass seed.

Mr. Tuttle. I would say that I picked strawberries last season for the market as late as the twentieth of July where the vines had been covered with corn stalks. Speaking of the quantity picked in a day, I had one hand that picked eighty quarts in a short half day and another hand that picked seventy-two.

Mr. Elliot. I would like to hear from Mr. Isaac Gilpatrick: he is a gentleman who has had some experience as an amateur; perhaps some that grow strawberries on a larger scale may get a point or two from him.

Mr. Gilpatrick. My experience has been somewhat limited, but I mulch with straw and manure and cover the ground with corn stalks also; I prefer the corn stalks. It does not take very much time for mulching and I never had any too much time. I have grown the Wilson and the Crescent, the Eureka and the

James Vick's. I prefer corn stalks to anything that I can find for mulching.

President Smith. I would state that my friend Elliot took me out to see Mr. Gilpatrick's plantation; I think it is certainly the finest plantation of strawberries I have ever seen. He had taken a great deal of pains and they were in fine condition.

Mr. Gilpatrick. I have had hands who picked sixty quarts a day and not less than forty, and I have never used a drop of water. I have a pump so arranged that I could use water at any time and put it all over the bed.

Mr. Elliot. How fast could you pick those berries?

Mr. Gilpatrick. I never tried myself, but I had a girl seventeen years of age who was out and picked without anyone's saying anything to her, and she picked a quart in four minutes. She got on her hands and knees, and they were right where she could get a hold of them.

Mr. Tanner. Mr. President, I would like to know if sowed corn would not make a better covering than corn stalks.

Mr. Smith. The objection would be that the stalks would lie down so close to the plants that it would have a tendency to cause them to ferment and injure the vines; the corn stalks would make it a little more open, and I don't think the sowed corn would be so good for the roots.

Mr. Harris. I think there would be danger in using sowed corn if three feet of snow should fall upon it before the ground was frozen; when you woke up in the spring you might be minus of your strawberries. I like corn stalks for mulching. The best patch of strawberries I ever saw were mulched with hop vines. The man ran out of straw, and he had a hop yard of an acre, and utilized the vines for that purpose. Speaking of picking strawberries, it is pretty good picking a quart every four minutes. My daughter went out last summer and picked one hundred quarts in six hours and ten minutes of the Wilson Albany strawberry, and carried the baskets to the end of the rows and got her baskets back. That was pretty good picking, and the vines were not mulched, either; they were pretty good berries.

President Smith. Isn't it a better way to mulch as Mr. Gilpatrick does? He mulches close up to the vines, especially on the south side. I am inclined to think it is better to mulch close up to the vines than to cover the ground and the plants so much.

Mr. Gilpatrick. I have never lost a plant where it was mulched close up on the south side.

Mr. Harris. I have seen a good many of the Wilson spoiled by covering them with marsh hay; I had rather do without any mulching than to cover them too much.

Mr. Gideon. I have mulched with straw and marsh hay and with leaves, and I have grown them without any mulching whatever. I have lost plants when mulched with straw, with hay, and with leaves, but I never lost any plants yet when they were not mulched. The best crops I ever grew I grew without any mulching.

Col. Stevens. You are in a peculiar situation; you are in the Big Woods and not on the prairie.

Mr. Gideon. No; it is not on the prairie.

Mr. Elliot. I think there is a difference there; difference of location should be considered. I think if Mr. Gideon lived on the prairie he wouldn't do that way. I think there is one point that we should recognize always in covering strawberries, not to cover early, but cover them when the ground is frozen so that it will bear a wagon, and then not enough so as to put them all out of sight; cover five or six inches, but not enough to cover the foliage out of sight. I think you wont have any plants that will be smothered, and your plants will come out all right.

Mr. Chandler. In the spring of the year should the straw be raked into the rows or taken off entirely ?

Mr. Smith. I would say in answer to that question that I would follow Mr. Brimhall's plan. I would plow between the rows and I would rake the straw back and leave it there. I mentioned this same thing last winter and some differed with me; I have since investigated somewhat, and from what I saw last summer, and from what I have learned by inquiries, I would say that whatever cultivation is given the strawberry it should be done between the time of gathering the fruit and the time that it froze up in the fall of the year; that the ground should not be disturbed in the ensuing spring at all. If you grow in rows mulch your berries, as Mr. Elliot says, just enough barely to cover the plant slightly; let the covering be raked off in the space between the rows, and in this way you will get better results than you can in any other way. This is my conclusion from what I have observed this past season.

Mr. Chandler. I think in our soil if you mulch it will have a tendency to retard the growth. I think that the straw should be raked off so that the sun can warm up the ground. It can be put back again just before the berries are ripe.

Mr. Brimhall. That is the way I do. I take the mulching off and put it back again.

Mr. Smith. What kind of soil is yours?

Mr. Chandler. Sandy loam.

Mr. Smith. And what is yours, Mr. Brimhall?

Mr. Brimhall. Clay.

Mr. Smith. That will illustrate the difference. With a sandy soil leave on the mulch.

Mr. Gilpatrick. On wet soil I would prefer corn stalks, and would make them very thick so as to let in the snow.

Mr. Pearce. In regard to mulching strawberries, I think it depends very much on the variety that you are going to mulch. If you have the Wilson or a tender variety you will always have to mulch.

Mr. Smith. Don't it depend about as much on how they are cultivated before mulching, whether in rows or on hills; whether suffered to run broadcast among the weeds, all over the ground, or kept clean with the runners clipped.

Mr. Pearce. I think there are very many strawberries in the country that don't need any mulching because they are already mulched. I have seen acres of them.

Mr. Harris. Mr. President, those strawberries need something. With us last winter strawberries winter-killed. I wouldn't give a cent to have my strawberries covered. But the time we need the mulching is in the spring because the drought cuts the crop short, and it always makes the berries smaller; and sometimes they become dried up and are utterly ruined in one or two days.

Mr. Pearce. What I meant to say was there are a great many beds where they are covered up with weeds.

Mr. Harris. Did you ever get any berries from that kind of a patch?

Mr. Pearce. No, never.

Mr. Kenning. I would ask where strawberries are raised on the bleak prairie and mulched, whether the snow would not have a tendency to bank up five or six feet deep and smother them? Whether that will have a tendency to kill out the plants or not?

Mr. Smith. I don't think they would be successful there unless they ridge the ground somewhat and plant on the ridge. I would mulch lightly if the ground is frozen. To leave the ground level, as on sandy land here, when you put mulching on you find them in the same condition in the spring, all frozen into a bed of

ice, and dead. If you ridge your ground so as to carry off the water and leave your plants out of the water, and mulch very lightly after the ground has frozen in the fall, then you wouldn't have any trouble with them heating.

Col. Stevens. Where Mr. Kenning lives, at Bird Island, it is prairie and the snow blows off in the winter much more than it does here or east of the Big Woods. I raised strawberries out in McLeod County without any mulching at all; but it was when there was a good covering of snow on them in the winter. When there was no snow, as a matter of fact, they all winter-killed. When there was snow, or they were mulched with corn stalks, I never knew of a plant to be killed, even if the snow might be two or three feet deep. But as a matter of fact the snow in Renville County usually is not as deep as it is east of the Big Woods.

Mr. Tuttle. I don't think there is any danger of smothering the plants when mulched with corn stalks. I have never discovered an instance where they would not come up through the corn stalks, when coarse stalks were put on.

Mr. Harris. It is very difficult for us who are not acquainted with that prairie country to lay down a rule for them to follow. But I think from the facts elicited by this discussion we may conclude that corn stalks are the best mulching that we can recommend. I have never known strawberries to kill out by reason of the snow covering them unless there was something under the snow that caused them to ferment; the quantity of snow piled above don't affect them. I had a solid bed of ice on one of my beds and supposed my strawberries were ruined, but that year had the best strawberries I ever grew.

Mr. Elliot. I would inquire if there are any new varieties that are better adapted to our climate than the Wilson?

Mr. Whipple. I would like to have that question qualified; better for what purpose, whether for table use or for market?

Mr. Elliot. For dollars and cents.

Mr. Whipple. I would say there is as far as dollars and cents is concerned, that is for a near market. If you have to ship them you need the Wilsons, and I don't think there is anything that will compete with it; but the Crescent I think will compete if you have only twelve to twenty miles to carry them. I can raise a great deal more on the same quantity of ground than of the Wilson and they will sell just as rapidly.

Mr. Pearce. Mr. President, in regard to the different varieties I think that every nurseryman has an idea that the plant

that sells the best is the kind to raise. I have an idea that they would set the varieties they sell the largest amount of, and would be strong evidence that that was the best variety.

President Smith. The best advertised is not necessarily the best.

Mr. Pearce. The Crescent is good, and if a man has the right kind of soil and gives them the the right kind of cultivation he will have a good crop; and when you can send out a plant that universally in all kinds of soil and with all kinds of people have them get a good crop, that is the kind we want.

President Smith. That has always been the Wilson.

Mr. Pearce. Not necessarily; not in my experience. I have sent out thousands and thousands of the Crescents and never had any come back; I have sent the Wilson out and they said they failed. The Wilson is a good and profitable berry.

President Smith. I would state for the information of Mr. Pearce that I bought a quantity of the Crescent paying \$2.50 a hundred for them and they proved worthless and I was compelled to dig them up and throw them away. My soil was rich and they wouldn't produce any berries. I have never been able to grow the Crescent Seedling with any degree of success while I have had no trouble with many other varieties I have grown.

Mr. Whipple. What is your method of setting plants?

President Smith. I grow them in rows and have the rows about two and one-half feet apart.

Mr. Whipple. I set my plants about two feet apart in the rows and the rows about four feet apart.

Mr. Tuttle. I have grown the Crescent Seedling on very rich ground, but I never manure the ground where I put the Crescent Seedling. I probably set the first Crescent Seedlings that were set in Wisconsin. A friend of mine originated them. I saw the plants two years before they were sent out. To look at the soil on which they were grown it would not be supposed it would produce anything; you could hardly find any poorer soil anywhere. It was on the sand and among jack-oaks that the Crescent Seedling was originated. It was quite sandy, poor, thin soil. I think I have seen the Crescent on very rich soil, where it was highly manured, and it would hardly do anything; but I don't think there has been a plant produced that will succeed better in the hands of everybody and produce more bushels of fruit. And yet my friend Mr. Parmele says that he has something that beats it; and if he says he has I know he thinks he has; I have known him for some forty years.

President Smith. With me the Captain Jack has produced well; it is very hardy and produced good crops of berries.

Mr. Smith. Mr. Jenkins has some very fine appearing strawberries and thinks he has something very nice. I should be glad if he would exhibit them and tell us about them.

Mr. J. W. Jenkins. I see by all this discussion here that I am an odd sheep in the flock; I see by what has been said that there is no one that takes the same course of growing a berry that I do. In regard to mulching, I never do that. I just merely put out my berries, working them sufficiently a portion of the season that I set them out, and then I give them up entirely and don't do anything more with them. I pick from those berries three years after that. I generally get a good crop. The weeds that grow after I have done working my berries I consider the best mulching that can be had. I have studied that, or got that in part by studying the nature of the wild berry. In my experience in going out and picking the wild berry I have found where there are woods and grass to protect them to a certain degree I have found the best berries, and I have found the same to be the case in growing tame berries. I have grown a good many varieties of berries. I have been at it some twenty years or over and have succeeded in growing a berry from the seed. I started that berry nine years ago. I have kept that within myself with the exception of four or five where I sent out the berries last year who have grown the berries and fruited them. I am selling a few of the plants. As to this fruit which I have exhibited here I would say that it was the remotest idea that I should exhibit it in such a place as this; I merely put up that fruit as a sample to canvass with, and was using it for that purpose when by chance I met Mr. Smith on the road and by our conversation the matter was brought out, and he prevailed upon me to come to this meeting and exhibit it; I have done so. I am not a member of your association, but merely did this at his request. Any questions that any gentleman may ask in regard to this berry, I would be willing to answer if I can.

Col. Stevens. I would ask Mr. Jenkins where he propagated them?

Mr. Jenkins. On my farm in Hennepin County.

Col. Stevens. Is it a seedling variety?

Mr. Jenkins. It is a seedling. It is said to be from the Golden Medal. I had it from that, and I suppose it was.

Col. Stevens. It is a very valuable berry; it looks to be about the largest I have ever seen.

Mr. Jenkins. If you will come to my place I will show you my berries, and I have weeds growing in there that are as high as my head.

Mr. Whipple. Is that a perfect plant?

Mr. Jenkins. Yes.

Mr. Whipple. When the spring of the year comes, do you gather the weeds and take them out of the way?

Mr. Jenkins. No, sir, not unless there are too many weeds to bother about picking; if there is, I let them stand until there is no danger of freezing, and take a scythe and run over the bed and let them drop on to the bed. I take off a certain portion from the bed where they are too thick. That is all I ever do to my berries.

Mr. Whipple. Does not what some call the native blue grass trouble your soil? It is a wild grass that grows upon a wet soil in this country. I cannot succeed with berries if I let them stand two years, without having this grass take possession of the whole ground.

Mr. Elliot. I would inquire, is this a firm flesh, or good market berry?

Mr. Jenkins. It is; it stands carriage well. I don't know of a quality that would add to the berry. It is as fine a shipping berry as I have ever had, it is the finest table berry I have ever used, and in every respect it is the best berry that I have ever seen grown. It is a late bearer, and holds in bigness in size better than any other berry I have ever seen; and another thing, they don't run to vines; they are perfect in bloom, need no fertilizer. I don't work them only the first year, and only until about the middle of July, and all the weeds that grow after that I consider a benefit. They are very vigorous in their growth. I mark my ground to set my berries the same as I plant corn, three feet eight inches one way and about two feet apart in the rows the other way. I never cut a runner, never disturb them—let them grow as nature designed they should.

Mr. Smith. What kind of soil have you?

Mr. Jenkins. I have different kinds of soil on my farm and have tried all parts of the land, and it don't seem to make any difference, although sandy land brings them earlier. My farm is generally a black, sandy loam. I have got this method of cultivating by being constitutionally lazy. (Laughter.) If I haven't I guess it has been a fast growing disease, and it has got fast hold of me.

President Smith. Then you consider them a first-rate lazy-man's berry? (Laughter.)

Mr. Jenkins. Well, I consider them about that.

Mr. Elliot. That is not the berry we want for our Horticultural Society.

Mr. Grimes. I move, Mr. President, that a committee of three lazy men be appointed to test the merits of that berry. (Laughter.)

Mr. Whipple. I move that Mr. Grimes be the chairman of that committee. (Renewed laughter.)

President Smith. I don't hardly know where to select such a committee among old friends here.

Mr. Whipple. If it is in order, I have an advertisement here of a new kind of raspberry that I would like to show and see if there is anyone that knows anything about it; I do not. It is called the Hansell.

Mr. Dartt. Would it not be better to wait till we have the report of the committee on new varieties?

Mr. Elliot. I move that we take up the subject of the cultivation of raspberries.

President Smith. It will be in order without a motion. You can ask your question whether anybody knows anything about the Hansell.

Mr. Whipple. Would that come under cultivation?

President Smith. It is in order. If this is the Hansell I would say that I planted some last year.

Mr. Smith. I would ask Mr. Tuttle if he has ever grown the Hansell?

Mr. Tuttle. I never have.

Mr. Dartt. Who has the plants for sale? That is what I want to find out.

President Smith. I will state that I received from Storrs, Harrison & Co., of Paynesville, O., some of those raspberries and I set them out; but I have no plants for sale and don't expect to raise any for that purpose. I only planted a couple of dozen; but I was very favorably impressed with the growth and the fruit. I had some fruit, but I wish to say that in my opinion it requires time to test whether they will be of any benefit to us or not. I sent for fourteen varieties last year and tested them, but am not able to make a report till another year on their merits. Capt. Goldin, of Wabasha, has raised them for some years and also the Superb. I wrote to him last spring in regard to it.

Mr. Whipple. I notice they state it stands the cold winters, and they call it more of an iron clad than the Turner or the Philadelphia.

President Smith. There is another new variety that I received from Mr. Campbell last year that is extolled very highly. It is the Crimson Beauty; said to be very hardy.

Mr. Grimes. Has anyone had any experience with that variety? I set out a few plants last spring.

President Smith. I think I set about fifty plants last year; that is all the experience I have had. Have not carried them through the winter yet. I may say that side by side, the way they grew this past summer, the Hansells did the best.

Mr. Pearce. Mr. President, what has been the result of the Cuthbert, so far as you know?

President Smith. It has been first-class about St. Paul, and so far as I know it has done well.

Col. Stevens. Is it better than the Turner?

President Smith. It is more firm and will bear transportation better and it is therefore a better market berry than the Turner.

Mr. Whipple. I suppose it holds about the same grade as the Doolittle; a better berry in the market but not as good to eat.

Mr. Harris. The Cuthbert is a very good berry, far superior to the Philadelphia.

Col. Stevens. Isn't there a great difference in the manner of growing the Turner? I understand that Mr. Whipple, at Northome, raised the Turner and the fruit was perhaps one-half larger than those raised in the immediate neighborhood, from the simple fact of mulching and the use of fertilizers. I understand he had Turner raspberries larger by one-half than those usually grown.

Mr. Sias. We have succeeded in finding the lazy man's strawberry, and now I think if we want to find the lazy man's raspberry that we might recommend the Turner for that position.

President Smith. I don't think you are right about that; for you will have to take off the suckers that sprout up from the Turner plants or you will not get many berries.

Mr. Shannon. I would like to state my experience with some Black Caps and get somebody to help me out. I had a row of plants that were promising at first and after they bore the berries dried right up.

Col. Stevens. What was the situation?

Mr. Shannon. It is on a side hill. They were planted in a row and had a northern exposure.

Mr. Pearce. What was the variety that dried up?

Mr. Shannon. About half of them were the Doolittle and half said to be the wild raspberry. They were not Thornless.

Mr. Smith. I can tell you how you can raise raspberries: stake them or put a trellis along the rows, of the proper height, so that you can cover them a little in the winter. I have succeeded in doing that in two ways. I set the plants close together and drive some stakes and put some cleats on to hold the canes up about two feet from the ground. I pinch the ends of the canes back. In the fall I throw a few corn stalks along on the top of that trellis to shade and protect the bushes; in that way I get a crop of black raspberries every year. The other way is to keep them in girdles by driving down stakes or slats around the canes so as to make a frame-work and keep them up in that way, pinching them back so as to make a second growth come out. Cultivate around the canes three or four inches deep, and in the fall throw a little handful of corn stalks over them, or marsh hay. Then in the spring work them in among the roots. I think Mr. Shannon in this way would have been able to get some berries even if the canes did kill down some. If you fix your trellis so the snow can't break them down and throw in some mulching in the fall, and in the spring work it into the soil there will be no difficulty in getting some berries. They ought to produce a big crop every year.

Col. Stevens. At Mr. Shannon's place it is different probably from most other places in the State. At Granite Falls there is a heavy granite deposit, and I apprehend you would not go very far before you reach it.

Mr. Shannon. I had the same fruit on a hill and I moved it down and had the same experience in both places. I gave a friend of mine some roots and he planted them about in the middle of our county in a different kind of soil, although the exposure is about the same, and he doesn't get any fruit. He told me last spring they seemed to come through the winter all right and showed blossom but after that dried up. It seemed to him there was not strength enough in the roots to ripen what they had started.

Mr. Smith. That is the whole trouble; there was not sufficient vitality to the plants. You will frequently meet with this trou-

ble and you cannot make a surety of a crop every year unless you cover them every winter. The only way is to have some sort of trellis, so that they can be kept from breaking. You can raise them without, but cannot with certainty. I would as soon have ten plants with protection as one hundred without protection. Then, when I have the plants set, I would mulch them very thoroughly.

Mr. Harris. Mr. President, some of that I believe and some I don't. (Laughter.) I believe the gentleman over there (Mr. Shannon) has been swindled on the variety of berries he got and I will tell you why. I have been very successful in raising the Doolittle and the Seneca, and some other kinds of berries. I sent down to some place in Illinois and bought five hundred plants and never got five hundred or two hundred quarts of fruit from them. Now, if the fault with his is not in the bushes I think the corn stalk mulching is the very best thing he can follow; but don't be afraid of getting it on too deep. We feed all our corn fodder and try to have it used the same winter. On the outside there is frequently a little that is only bruised by the cattle and horses tramping on it. If you use that your raspberries will be much better. I don't lay the bushes down but mulch under them.

Mr. Kenning. I have tried the Black caps three years and have had the same experience as Mr. Shannon. Instead of having berries there are one or two little seeds on the bushes that dry up. I finally became disgusted with them and dug them all up. Got my plants from a party at Hastings.

Mr. Shannon. I would state that I got about half my plants from my father in Blue Earth county, and with the same kind of plants he had great success. The others I got from a gentleman who had taken the wild Black caps and had lots of fruit every year. I am quite sure I had the Doolittle plants, so I think the trouble was not on account of the kind. I think it must have been something in my soil or in my head.

Mr. Harris. I would make one more trial and try mulching under them thoroughly with corn stalks.

Mr. Shannon. My man put manure around them last winter.

Mr. Gilpatrick. I planted the Doolittles twenty years ago. I have succeeded in raising them every year, covering with nothing but dirt during those past twenty years.

Mr. Pearce. My experience is that every variety kills, although some say not. There is a great deal in the selection of

the ground to plant on. They will bear a good deal of shade. A grove on the west or south is very good, the south the best. As a general rule we have to cut them back in the spring until we get sound wood. If your plants are injured they are bound to come out to the tip end, but you get small blossoms and small fruit; it is bound to do it. Don't be afraid to cut back to sound wood. You may have to cut off two feet. I have trimmed them when they were thought to be dead and would cut some stalks clear down; but have had a good and paying crop. Unless you have a favorable locality you will find that the Black caps generally winter-kill. The same trouble is found with the red raspberries, and you have to trim to the sound wood. If this rule is followed I think you will have no trouble with the berries drying up.

Mr. Whipple. I have had only twenty years' experience with berries. My rule is, if I want to get a crop of black or red berries, to keep the ground in such condition that when you are picking the fruit you can take the dirt in your fingers and make it into mud balls. In order to do that you have to mulch the ground. Mr. Harris is right as far as he goes; he has not got quite enough of the amber cane yet; that holds the moisture the best of anything I have found.

Mr. Harris. I have seen that used and I know it is first rate.

Mr. Underwood. If it is necessary to emphasize the importance of mulching I might do it by stating some of my own experience. I had a Swede in my employ who could not understand a word of English, and I set him to mulching some raspberries, making him understand by signs what I wanted him to do. About an hour after he came around indicating that he had the job done. I sent him back and had him do it over again, and an hour after repeated the same thing. He was pretty well along in years and thought he knew something, and was disposed to get provoked about it, and when he came around the next time I found he had put on the whole pile of manure, and it was at least a foot and a half thick. But I would say that I never had so many berries before or since off the same quantity of ground as I had from that piece. So I think that all that has been said in favor of mulching raspberries has been said in the right direction.

Mr. Pearce. Speaking of mulching, I want to say one word more. Mr. Whipple had certainly the right way of mulching with the amber cane straw; he put it on about a foot and a half

thick. He was very partial to the Turners. I have been growing them on my grounds, but mine have not been mulched. My berries were a little under size last year. We had a good many berries. I have made up my mind that I am going to plant out my berries and plow them out and reduce the quantity of stalks; but I don't think I shall mulch any, because I haven't anything to mulch with. We want an early bearer; it is the early variety that brings the money, and I think that is the Turner. I think by cleaning out the rows I can get fair sized berries. We want to get them two weeks earlier, and if you don't, the Philadelphias come in. People want berries in the season right along, and the earlier the better. That is the reason I am opposed to mulching; it brings the finest kind of berries, but it brings them in market a little too late, when the high price is over. I would rather have a little smaller berry and have them very early, when you can get twenty-five or thirty cents a quart; but if you want big berries you will get them by mulching.

Mr. Jenkins. I don't know very much about raspberries, but I would like to inquire if there is any advantage in pinching back?

Mr. Smith. Yes, they ought to be cut back in order to get a vigorous growth.

President Smith. My experience is that you don't need to cut them back, but I recommend pinching them back when the canes are not over two feet high. As they grow out I would pinch them back.

Mr. Whipple. I think the president has hit it; and the time to do that is just when you are expecting your berries to ripen. When you are out in the patch looking at the bushes, pinch the ends back, and by the time you get through looking for berries your briars will all be pinched back. That is the time to do it.

Mr. W. Muzzy, of Fergus Falls. I live in Otter Tail County and am not a member of your society, and don't know as I have a right to take part in this discussion; but I would like to ask about whether it would not be necessary for us in our locality, to remove this mulching so that the sun would cause this moisture to dry off so that the canes will ripen. I am trying that to see if they will not kill back. I also think that to be sure of success we need to have our patch of raspberries somewhere in a protected place where the southern sun can get in and warm them up. I notice that some of my neighbors have lost their canes by the sun warming them up too soon. Then the frost would kill them. I would like to hear a word for our enlightenment up there.

President Smith. I would state that we have no fruit growers in our society here from the northern part of the State that I know of that would report in regard to that. But I would also state that in the regions of Lake Superior they have an abundance of wild raspberries which grow well in either the shade or in the sun. That is a very different locality, but they ship berries from there in large quantities.

Mr. Muzzy. I would say that we also have the very finest wild raspberries in our section of the country that I have ever seen in any country.

Mr. Smith. Mr. Morford, who lives up on the line of the Northern Pacific road, had a splendid crop of berries on his place. I wrote him to send me a letter to tell how he did it, but I have not heard from him yet. I would like to inquire if anyone has had any trouble with mice working in their raspberries, and if so, what they have put in as a preventive.

Mr. Whipple. If you put in wheat straw or something that has grain in it, it will draw the mice and they will girdle the canes.

Mr. Harris. I have lost a good many bushes where mice got in and gnawed them off. A good way is to take a little corn and soak it, mixing in a little strychnine, and put it into an oyster can and poison the mice, and then you are safe; and I believe some of my neighbors use Paris green. The mice are apt sometimes to get in any way and destroy the Blackcaps.

Mr. Whipple. The principal preventive I have is a good shepherd dog that takes all the rabbits, and some good cats that keep the mice down.

Mr. Harris. This is a short-tailed field mouse that does the mischief, and sometimes comes in from the woods.

Mr. Ford. Mr. Chairman, I lost my entire crop of raspberries. They started well and soon seemed to die out. If there is any gentleman here who has had a similar experience, I would like to know from him his opinion of the cause, and to know the remedy.

Mr. Smith. Repeat your experience.

Mr. Ford. I planted about an acre of raspberries of Cuthbert, the Philadelphia—about a thousand Cuthbert, the balance Philadelphia and Turners. I planted them in the early season; they sprouted well and grew so you could see the buds coming through the ground, and then began to die after being only about four inches high; so by July I hadn't any.

Mr. Whipple. Did you examine to see if there were any cut-worms?

Mr. Ford. I attributed it to them.

Mr. Smith. I think I can explain that. I planted five hundred Philadelphias and they all went in the same way. They were out of the ground a little too long before they were set. The long roots all died, but they sprouted up at the centre, lived through and grew up, while the old raspberry cane died a perfectly natural death. The new roots made no new wood; I examined a number of them. When you set out a year-old cane of the red raspberry, unless it throws up a sucker from below the ground, I think it is going to die by the first of August. Yours did not throw up any suckers, did they?

Mr. Ford. Yes, sir.

Mr. Smith. Well, mine did not; I think they just died a natural death, because there were no new roots or new wood.

Mr. Ford. My plants were set out in the spring, and were very thrifty, and had very fine roots, but the suckers seemed to die.

Mr. Pearce. Did you notice whether there were any cut-worms?

Mr. Ford. There were plenty of cut-worms.

Mr. Harris. I think likely that was what was the matter.

Mr. Pearce. We had a terrible time with a species of cut-worms; they were not common cut-worms, but seemed to be a sort that went off into the grass and staid, and came out at night. They would cut off the leaves. I set out raspberries and they would cut them off. They injured my plants very much. It never made its appearance there till last season. It is not the common kind of cut-worm, but it is a very active worm.

Mr. Ford. I think my observation agrees with that of the gentleman; I think it is not a common species of cut-worm.

On motion of Mr. Sias the meeting was then adjourned till 7 o'clock in the evening.

EVENING SESSION.

TUESDAY, Jan. 20, 1885.

The meeting was called to order at 7 o'clock in the evening by President Smith.

The following communication was received and read:

RESIGNATION OF MR. MENDENHALL.

MINNEAPOLIS, Minn., Jan. 19, 1885.

Truman M. Smith, President State Horticultural Society of Minnesota,

DEAR FRIEND: Owing to continued ill health I hereby tender my resignation as entomologist of the society, not being able to properly perform the duties thereof, and I ask its acceptance.

Very respectfully,

(Signed,)

R. J. MENDENHALL.

Mr. Pearce moved that the resignation of Mr. Mendenhall be accepted.

Mr. Grimes. Before that motion is put I would like to say a word. I must say that it is with a good deal of sorrow that I learn of the resignation tendered the society. Mr. Mendenhall is, perhaps, one of the best entomologists in the State, as well as one of the most earnest workers in the State. Before that motion is carried, I think the society should express its sincere thanks for the labors he has performed. We have never paid him for anything he has done, although he has made thorough investigations and faithful reports, as will be seen by reading former reports of the society. I would move that we tender him a vote of thanks.

Mr. Harris. I should hate to be obliged to accept the resignation at this time. It seems to me we had better try and get him to prepare an article for our forthcoming report. I staid with him last Friday night and we talked the matter over. I understood he was willing to prepare such a report. He seemed desirous that the society should appropriate a small sum, from six to ten dollars to purchase illustrations for it. We do not want to work a sick man, but it does not seem as if we could well spare him until the coming report is published. We may accept his resignation so far as not to re-elect him for the coming year. Mr. Mendenhall has been a generous and noble member of the society. He has stood by it for years. At one time he and Mr. Elliot each loaned the society \$100 to get out the report, and it was a number of years before we were in a condition to repay it; but neither of them charged us any interest on the money. He has been one of the live members of our society. In addition to tendering him a vote of thanks for the services rendered us in the past, I would move that it be resolved that we exceedingly re-

gret this act of tendering his resignation. Only last week he resigned a similar position in the Academy of Natural Sciences at Minneapolis. I have no doubt he will furnish articles for us. Two years ago he was elected entomologist of the society, and re-elected last year. It is an election that lasts for one year. We can accept his resignation, but we must not give up hope of getting a report from him.

President Smith. I would suggest that a committee might be appointed, consisting of Mr. Harris, Mr. Elliot and Mr. Grimes, to wait upon him and convey to him the thanks of the society and ask him to prepare a report for publication.

Mr. Pearce then withdrew his motion.

Mr. Underwood. If you will allow me to offer the motion suggested by the president, I would move that the committee named be appointed to confer with Mr. Mendenhall, and express to him the thanks of the society for the valuable services he has rendered us, our regrets at his ill health, and the committee be instructed to make such further arrangements as they may see fit with regard to the forthcoming report; that they be authorized to provide for illustrations. I will offer that as a resolution, and will reduce it to writing if desired.

Mr. Dartt. Mr. President, it seems to me if we simply accept his resignation and tender him a vote of thanks, with a request to prepare an article for publication, that will be the simplest and easiest way and most satisfactory; the less machinery we have, if the object is accomplished, the better.

President Smith. I understand he is willing to prepare the article if these cuts are furnished.

Mr. Harris. He has consented to furnish an article, and he requested me to bring the matter before the society if he was not able to be here, to have a small appropriation made, not to exceed ten dollars.

President Smith. I know that he has always been a worker in the society, but I do not want to force my views upon the society in any way.

Mr. Smith. There does not seem to be any objection to the furnishing of these cuts, and I can see no objection to the committee; I am satisfied they can do this better than we can express it in writing, and I think we can leave it to them. I would be in favor of employing a stenographer to assist him if he is unable to do the work of writing out the report himself. I think we need a little more instruction upon these subjects, such

as a good entomologist can give us. We want to investigate these matters, and get all the light we can on the subject.

The resolution of Mr. Underwood was adopted.

The following communication of Hon. O. M. Lord was then read:

FRUIT REPORT FROM O. M. LORD.

MINNESOTA CITY, Jan. 19, 1885.

Apples, especially the early kinds, were abundant this year throughout Winona County. The local markets were well supplied with Duchess, Tetofsky, Fameuse, Haas, numerous varieties of crabs, and some seedling apples. St. Lawrence, English Russet, Utter's Red, and Wealthy were also in the market. Strawberries were very abundant, but frequent showers interfered with the picking. Red and black raspberries were plenty and good crops of blackberries. There was also a good supply of native plums.

The weather in the fall was considered favorable for fruit trees to mature the new growth, and it is believed they were in good condition to withstand severe cold.

The experiment station here is hardly worthy of a report, as only a small beginning has been made. The plum cions furnished by the society were set and have made a fine growth; also cions from seedling apple trees of merit grown in this vicinity. A few trees one year old, and some two years old, of kinds that have not been tried in this vicinity, have been planted as experiments. There are also thirteen kinds of native plums, some of them in bearing, which are receiving special attention.

The following letter was then read from Mr. E. Wilcox, proprietor of Mount Hope Nursery, near La Crosse, Wisconsin:

REPORT FROM E. WILCOX.

MT. HOPE, NEAR LA CROSSE, WIS., Jan. 18, 1885.

T. M. Smith, St. Paul,

DEAR SIR: We have had two cold winters before, but this generally is colder than the two preceding. With me, however, the thermometer has only touched 32° once this winter, while last it went down to 36°. What surprises me is the great difference in

reports of cold this winter in localities only a few miles apart. In La Crosse, two miles from me, 38° to 40° below; at Galesville, 30 miles, 54° below; at other places 40° to 49° . Have we any kind of standard apple except Duchess, and some seedlings which have stood for 30 years, that will stand 54° below? Time will tell.

Now, about fruit. Last year the Duchess in some orchards bore heavy crops of fair, large apples, while in other orchards only a few miles away it was entirely ruined by the apple gouger; this and the codling moth are, in my opinion, the great enemies to successful apple-growing, with such hardy trees as Duchess and some seedlings which are coming to the front, in the Northwest; the Wealthy is not one of them, however. This tree I believe in for these reasons: Its early and great bearing, good quality and good keeping. I keep setting it every year; it will bear a few crops and die. To class it with Duchess for hardiness is all bosh.

The apple crop last year was what might be called a good one; the following kinds bore heavy crops: Wealthy, Utter, Fameuse, Haas, St. Lawrence. I saw a few trees of Golden and Perry Russet bearing so heavily and such nice fruit that I almost regretted that I had condemned both years ago. Whitney and most of the crabs bore well, except the Transcendent, which was nearly a failure. All were badly worm eaten.

Small fruits, such as strawberries, grapes and raspberries, such as Turner and Gregg, were fair crops; the raspberries, too, without protection; Cuthbert nearly a failure; blackberries the same; De Soto and other wild plums, with me, blossomed full, but the fruit nearly all dropped when quite small. What is the cause? Mr. Peffer says that they need a fertilizer the same as the strawberry. I attribute it to frost. A hailstorm in July nearly ruined my grapes and injured my apples very much. E. WILCOX.

Mr. Harris. I would like to make one observation in regard to the location of Mr. Wilcox's nursery, as regards his plum orchard. He has a northern slope; his trees were full of blossoms, and before the plums were half grown there was hardly one left on the trees, and I cannot account for it. I only visited his place once this past season. I have been there when his trees were in blossom and looked like a sheet, and then in mid-summer there was nothing on them. He attributes it to the effects of the sun or to the frost, I believe. Mr. Peffer went out and looked at them and he thought they didn't fertilize themselves; but I am certain he has ten or a dozen varieties.

Mr. Smith. Does not the northern breeze that comes down that northern slope through the Trempeleau Valley cause the trouble. He cannot get a northeast wind.

Mr. Gideon. We have had ours cleaned out several times when the trees were set full of blossoms. On examination of the fallen fruit we found the mark of the curculio on every one.

Mr. Harris. Where this nursery is located the sun does not shine on it fairly for an hour after it shines on our side of the river. Some of my trees hang full of fruit till they are ready to break down.

President Smith then proceeded to deliver the annual address:

PRESIDENT'S ADDRESS.

Ladies, Gentlemen and Members of the Minnesota State Horticultural Society:

Twelve years have passed and gone since the present organization of the Minnesota State Horticultural Society and the adoption of the present constitution. On Feb. 27, 1873, the first act was passed by our legislature giving us aid and authorizing the printing of our reports. Although the nucleus from which the society originated—the Fruit Growers' Association—had its origin and start at the State fair in Rochester, A. D. 1866, yet from that date commences our history as a society.

Now, when we look back and see the condition of fruits growing in Minnesota at that time, we find there was scarcely fruit enough grown in the whole State to make a fair display at a county fair. Compare it with what was raised in 1883, according to the report of the commissioner of statistics, 180,735 bushels of apples, and from 200,000 to 300,000 pounds of grapes, and with the thousands of bushels of strawberries, raspberries, currants; and that the quality of our fruits and berries, was of the best, as none can dispute.

The award of diplomas and medals at the Centennial Exposition in 1876, and the award to our society of the Wilder silver medal by the American Pomological Society in 1883, at Philadelphia, will show how they were appreciated by others than ourselves, as at these exhibitions we came in competition with all the states in the Union, and carried off one of the only four awarded, and this for display of apples and grapes. And our

secretary, Mr. Gibbs, writes he now has and is putting up—January 12th, in New Orleans, over two hundred bushels of Minnesota apples, and that he has as fine specimens as any shown from any state, but not as many varieties. We now have single orchards that have produced over 1,000 bushels of apples per year the last four years; and vineyards that have produced from two to four tons of grapes for ten years or more in succession. We have farms that have raised hundreds of bushels of strawberries, raspberries, etc. Who can say that we can not and do not grow fruit here in Minnesota, and that this society has done nothing towards the development of fruit growing?

We have but just commenced our labors; we want more and hardier and better fruits of all kinds, and with the aid of the State experimental fruit farm and the experimental farm at the State university and our own experimental stations, we hope in time that Minnesota will be able to raise more fruit and cheaper, so that every man, woman and child in our State can have a full supply and plenty to ship to other less favored localities, and that every school house and farm will have its shade and ornamental trees and flower beds; in other words, that Minnesota will be a State worth living in, and we as a society hope to help to bring this about. But it will take time, for it has taken a long time to bring our fruits to their present standard; but by the aid of kindred societies and cross fertilization and other modes, we hope and expect to advance farther in the future than in the past.

We have asked for and received State aid to a small extent and we have used it for the benefit of the whole State. Our meetings and information gained therein are not of the star chamber sort, for all are cordially invited to come and partake and to assist us in our great work. Very few can understand or imagine the difficulties and discouragements that the pioneers in horticulture had to contend with here in our cold and dry climate, and without any knowledge of what varieties would succeed, and what obstacles we have to meet and conquer, and what there is yet for us to do before we meet with that full and final success we yet hope to attain. But I sadly regret that one of our best and most valuable native fruits has been neglected and not as plenty now as it was fifteen to twenty-five years ago, when in its wild and natural state, without cultivation there was plenty for our own use here in Minnesota and thousands of bushels to ship to other markets; I allude to the cranberry which is now shipped here from New Jersey and other

states and sold for sixteen dollars per barrel this present winter. This is wrong. Our society, our State Agricultural Society and our legislature should all combine to bring about a different state of affairs in some way, for I will assure you that our State, or its citizens cannot afford to raise wheat for forty to eighty cents per bushel to pay for cranberries at sixteen dollars per barrel, wholesale, when we have a soil and climate that produced them in abundance in their wild state before the cattle and other causes destroyed them. The value of this crop and the demand for it in all the cities of the United States and other countries, and the ease and safety with which it can be shipped, and in consideration that it can be kept well in a perfectly fresh state the year around, and the healthfulness of the fruit, all demand that it should receive the best care and attention, and we with others should encourage the cultivation of the cranberry as one of our very best fruits adapted to our climate.

Another great want of this society and the farmers of this State, is a good, competent State entomologist who should be located at the State university. Our agricultural papers should circulate all the information he could give them, broadcast throughout the State. Our insect enemies are almost too numerous to mention and most of us are unable to distinguish our friends from our foes; we all need information and should be apprised of our worst enemies among insects and how to combat them. They are many of them small but in many instances will be satisfied with nothing less than three-fourths to seven-eighths of the entire crop. The expense would not need to be much and I would recommend the appointment of a proper committee to bring the matter before the present legislature to ask them to provide for the appointment of a State entomologist in the interest of the entire State. If their interest in fruit growing is not enough the chintz bug, the potato beetle, the grasshopper and the Hessian fly, and many other insects that trouble the farms as well as gardens and fruits, should all act as inducements for them to help us and themselves at the same time.

In former years it has been customary for this society to appoint a committee to visit, examine and report to this society, the State university farm, State experimental farm, and I would add, the State reform school, and in that way much can be learned through our report which receives a large circulation. At one time the State reform school took a great interest and made a good exhibit at our State fairs in both horticulture

and floriculture, and would it not be to the advantage of the State and the inmates to have these trades and the interest in them increased in some way that they might send out more competent help in that line than can now be obtained.

I will call the attention of the society to the practice of paying salaries before being earned, or in other words of paying a quarter's salary at the beginning or middle of the quarter. I found such had been the practice and, of course, I could not well adopt new rules; but nevertheless I believe it wrong and would call your attention to it so that by a vote of the society it may be stopped, and it may save us from some trouble in the future; at least it can do no harm to have a time stated by a by-law or vote so that the president and secretary will know and understand when orders should be drawn.

I hope all the expectations and benefits to our State from our State exhibition at New Orleans may be realized, and if within the power of human efforts and the possibility to do so, I believe our secretary, Mr. Oliver Gibbs, Jr., and Prof. E. D. Porter and their assistants may help all they can to accomplish that result. With their knowledge and experience in such matters I think Minnesota has her interests intrusted to good men, and I believe this society and its members have and will aid them in every way they can. And this brings to mind that the next meeting of the American Pomological Society will be held at Detroit, Michigan, next September. In order to keep up our reputation it behooves us as a society to make the best show possible of fruit, especially of apples and grapes, which will then be just in prime for exhibition. We should make extra efforts to win another medal, or some other prize, and show them and our sister states we can show the finest fruits as well as number one hard wheat, and that we can and do grow almost anything that can be produced from the soil. I would recommend that you, at this meeting, appoint one or more suitable delegates to attend that meeting, to get up and take charge of the collection of fruits, and that you appropriate a sufficient amount for the same, and by commencing early and systematically the work can be done much cheaper and to better satisfaction to all parties concerned.

I must not forget to call your attention to the need of economy; our resources are small and the amount we receive from the State and members will not go far in large expenditures or pay big salaries, and so we must economize in every way consistent with our aims and the work to be done, and do the most good for the least

money. I hope you will be able to show the legislature and the public all the money we receive is fairly and honestly spent for the advancement of horticulture and the public welfare.

I would here recommend that our society give attention and time for discussion to floriculture and vegetables, and some time to forestry. We should especially encourage the cultivation of asparagus, rhubarb and such other hardy things that are of easy and simple cultivation and are in demand for home use and for market, and which can be grown on the farm or in the smallest yard, are perfectly hardy and of the easiest cultivation, and will yield more satisfaction to the masses for labor and money than almost anything else grown.

I would say, in recommending fruits and shrubery for general cultivation, I think hardiness should be the first thing to consider, and ease and simplicity of cultivation, as well as other good points, and we should aim to make all our teachings plain and simple, that they may be understood by all in order that we may live to see more and better fruits, and as plentiful in Minnesota as potatoes and wheat this last fall. This is the wish and most earnest prayer of your president. Thanking you all for your kindness and assistance in the past years, I remain as ever your friend and co-worker in horticulture.

ACTION ON PRESIDENT'S ADDRESS.

Mr. Harris. The address of our president has been both interesting and instructive. It shows that he feels a deep interest not only in the welfare of the Horticultural Society but that he takes laudible State pride in the success of the cause in our midst; and I trust that every member of the society shares in the same spirit. It should be our purpose and desire to advance and develop so far as we may the resources of the great State of Minnesota, and hasten the time when it shall be in the very front rank among the sisterhood of states. Having all these things in view I move that we tender him a unanimous vote of thanks for his able and interesting address upon this occasion.

The motion was put by Vice President Sias and carried.

Mr. Smith. I move that the chair appoint a committee of three on the president's address to report on Thursday next in regard to the suggestions made therein.

The motion was adopted.

The chair appoints as such committee Messrs. J. S. Harris, P. M. Gideon and Ditus Day.

CRANBERRIES.

Mr. Harris. There is one thing that I would like to mention at this time. I notice that our friend Mr. Tuttle, of Wisconsin, is here. I noticed last winter that there were a good many cranberries around his place; and I think I have heard somebody say that he discovered a marsh somewhere up there, and of either himself or his boys improving it, and I would like to have the society by some method invite him, or his sons, whichever has the most to do with it, to prepare an article upon the growing of cranberries for the forthcoming report. I will therefore move that they be requested to prepare a paper on cranberry culture for the forthcoming report of our society.

The motion was carried.

MEMORIAL RESOLUTIONS.

Mr. Smith. Mr. President, there are some old men here and as many of the honored names of distinguished horticulturists are from time to time dropping from the active sphere of usefulness, it seems to me that it is but right and proper that we should show to the relatives of such persons, as well as to the people of the country generally, that we appreciate the services of a lifetime which has been devoted to the interests of horticulture. It pains me to-night to announce the death of Hon. Charles Downing, of Newburg, N. Y., one of the very brightest lights of horticulture. He died last night at the advanced age of eighty-four years. I therefore move as the sense of this meeting the following:

Resolved, That in the death of Charles Downing the horticulturalists of the United States have lost one of their best and brightest men; that we deeply mourn his death and remember with gratitude the labors of a lifetime devoted to the interests of horticulture.

Resolved, That these resolutions be embodied in four records and a copy thereof sent to the relatives and friends of deceased.

Mr. Gideon seconded the motion.

Mr. Harris. That is probably all we can do in the time we have; but it seems to me that if we could secure a sketch of the life and history of this man and what he has accomplished, so as to make a full page in our transactions, comprising a concise account of his life and service, place of nativity, etc., I would like to so amend the motion as to have that included, to be also spread upon our minutes.

Mr. Smith. I will accept the proposed amendment and volunteer to procure such information for the society.

Mr. Tuttle. Mr. Chairman, I have regarded Charles Downing as the foremost man in horticulture on this continent. I have had the pleasure of his acquaintance; I have met him at his house. He was one of those men who worked unselfishly during a whole lifetime for the good of horticulture throughout the United States. He spared neither time nor pains; his whole energies were devoted to informing himself and imparting this information to the whole country on the subject of horticulture. I never met a man who, in the time spent with him, more deeply impressed me with kindly feelings and with the unselfish work in which he was engaged, than Charles Downing. This is painful news to me as I had not heard of his death. I had letters from him recently and have been in correspondence with him for years. The whole country has sustained a loss in the death of one of its brightest lights in horticulture.

Mr. Smith. I can second every word that Mr. Tuttle has said. I believe that Charles Downing was one of those honest men who never lent himself to any selfish scheme of any kind for money. He was a pure, upright, honest, straightforward man; and to receive the word of Charles Downing for anything was to make it so. I think he was one of the best of men in that respect. Ever since I can remember I have been in love with the man and revered his name. What he wrote on the subject of horticulture showed that his heart and soul were in the work; he loved it, he loved trees and plants and flowers, lived among and enjoyed them. He has done more, perhaps, than any other one man to educate the American people in horticulture and floriculture, teaching them how to beautify their homes, their grounds and gardens. We need more such men such as was Charles Downing, men that speak and act from unselfish motives.

Mr. Harris. Mr. President, the shock that comes to us in hearing of the death of this eminent man is quite as appalling to those of us who love horticulture as to the public generally the news of the sudden death of our chief magistrate. For in thousands of homes in our land the name of Charles Downing is a household word. There is probably but one pomologist living whose name may possibly be more revered and loved, and that is that of Hon. Marshall P. Wilder, now approaching towards his ninetieth year—eighty-seven years of age. If we had time to devote to this matter our society could no doubt spend a whole day in eulogizing this great horticulturist.

Mr. Gideon. I had no personal acquaintance with Charles Downing. I have been in correspondence with him for twenty years. I could heartily agree with friend Harris that no other man in the United States stands higher among horticulturists; he was first. He led out and developed, you may say, all the balance. I would not detract one particle from the greatness of Mr. Wilder; he has done a great work for horticulture; but still Charles Downing led us all. He has done everything a man could do to promote horticulture in the United States. Two years ago I concluded I would meet Charles Downing, visit and spend Thanksgiving with him. I went down there and thought I would take him a little by surprise. When I arrived I found he was in New York City, crushed almost to death by the cars and was unable to receive company, so I never had the pleasure of seeing him.

The resolutions were unanimously adopted.

Mr. Harris. Mr. President, I would take this opportunity to announce that we have lost from our roll of membership two persons during the past year. I am unable to eulogize either of them or to say anything in relation to them, as I was not personally acquainted with them. Mr. Stearns, I believe, has died within the year, and last Sunday, Richard Porter, late of Olmsted County, was buried. He has been an earnest and a zealous worker in his way in horticulture, almost all his life, and was popular and favorably known wherever he has lived. I would suggest that Mr. Sias be requested to prepare a memorial upon his death; I will make a motion to that effect, as he was a neighbor of Mr. Porter.

The motion was adopted.

Mr. Smith moved that Prof. Porter be asked to prepare an obituary notice of H. C. Stearns, of Minneapolis, which was also adopted.

OLMSTED COUNTY HORTICULTURAL SOCIETY.

The following report was then read by the secretary, of the Olmsted County Horticultural Society, and the report of the fruit committee of the Rochester district.

The twelfth annual meeting of this society was held at the office of the Rochester *Post*, on Saturday afternoon, Jan. 3, 1885.

Meeting was called to order by the president, A. W. Sias, who announced that our secretary had resigned by reason of his late sad misfortune,—that of becoming almost totally blind,—hence it was necessary to proceed to the election of officers. After the renewal of memberships, in order to become legal voters, on motion of M. J. Hoag, meeting proceeded to annual election of officers, which resulted in the election of the following:

President—A. W. Sias.

Vice President—R. L. Cotterell.

Secretary and Treasurer—M. J. Hoag.

Executive Committee—A. W. Sias, M. J. Hoag and J. J. Cassidy.

Mr. S. Wedge moved that the secretary cause a notice to be published in each of the Rochester papers inviting all persons interested in horticulture to join the society. Motion carried.

TREASURER'S REPORT.

Amount of receipts.....	\$66 50
Disbursements.....	56 80

Balance in treasury	\$9 70
(Signed,)	M. J. HOAG, <i>Treasurer.</i>

Number of annual members for 1885.....	50
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After some very appropriate and interesting remarks by our retiring secretary, Hon. S. W. Eaton, the society adjourned to meet on call of the president and secretary.

M. J. HOAG,
Secretary.

Rochester, Jan. 3, 1885.

The following communication was read from Rev. G. W. Fuller, of Litchfield, Meeker County.

REPORT ON FRUIT.

LITCHFIELD, January, 1885.

The past year gives us nothing new in the way of fruit. The Duchess and Wealthy continue to be the only large apples we can grow and too many of these yield to adverse conditions. The Transcendent is the only tree that retains its color under the repeated severe cold of this winter. All others are more or less colored.

The year has been a fruitful one. Large crops of strawberries, red raspberries, gooseberries, and currants well repaid the labor that produced them. Apple trees were also well loaded.

G. W. FULLER.

DISCUSSION.

Mr. Sias. I would say that the interest seems to be on the increase in Olmsted County so far as our local society is concerned. We now have a greater membership than ever before; I think our report says there are fifty members, but I think it is over that; some fifty-four or five I think it is. That is a pretty good showing for our county. I believe the society only had ten or twelve members the first year, and not over twelve the second. I suppose we are perhaps raising more fruit in our county than in any other county in the State, unless it may be the county of Wabasha. We think we have the largest orchard in the vicinity of Rochester that you will find anywhere in the State, an orchard that produced about 1,500 bushels of apples last year, and about 1,000 bushels of the Wealthy. I don't see any reason for our being discouraged in regard to fruit culture. I do not wish to take up the time further at present.

Mr. Harris. I don't know as it is necessary to make any motion in reference to these reports appearing in our report, as I presume they will be embodied in our transactions. There were some matters omitted last year.

President Smith. I suppose all these reports should appear; if they have been overlooked in the past it is proper they should appear in future.

Mr. Harris. The members of these local societies are entitled to copies of our transactions. I would state that there is no part of our State that is more promising in horticulture than Olmsted County. It was the birthplace of this society. I don't believe there was another county in the State at the time that could have given the poor little weak thing a birth; but it did it. And it has lived, although it pined along for a number of years. I predict for Olmsted County (unless the climate changes) one of the strongest horticultural societies in the State of Minnesota. I think they will wake up even Hennepin, which is holding weekly meetings, and they may well look to their laurels. I would suggest that their report for last year be published so that the world may see the progress made in a single year.

Mr. Sias. I would say in regard to that report that I handed it in, and there was a motion made to have it go into our transactions, but for some reason it did not appear; I don't know why. I regretted it very much on account of the address of Mr. Harris attached to it. That was perhaps the most important part. If it could be found and brought into the next report I think it would be quite a satisfaction to our society.

On motion of Mr. Smith the secretary was instructed to endeavor to obtain the missing report and to embody the same in the proceedings.

Mr. Dartt. Mr. President, there is a little personal matter between myself and the society that I might as well mention at this time as any other, if I don't kill more than ten minutes. Most of you know that I was a delegate to the meeting of the Iowa society; and the first year I made a report which was to appear in the proceedings. I wrote out my report and forwarded to the secretary and he published a portion of it and retained a portion for the future action of the society. Now, I rather suppose, in justice to myself, the balance of that report should be presented to the society. I have understood that he lost some papers and I don't suppose this would be considered any more valuable than some others and that he might lose it. If the balance of that report can be found and read I shall be glad, but if not I am prepared to furnish a nearly correct copy of it. It is perhaps not very creditable to me to make the report; it might be wise on my part to say nothing about it, but to let it drop. But I wrote the report and am willing to present it and take the consequences. If there is anything in it that is unfit to print I hope you won't have it printed, but whatever blame is attached to me I will stand. I don't want to sneak out of anything—I want to take all the responsibility that belongs to me. I wrote the report in such a way as I deemed beneficial to the society and to the cause of horticulture; it is made up of criticisms partially, and you all know that it don't take a great deal of talent to criticise, and that is the reason I made the report in that way. I will be glad to read the balance of the report at some future time.

Mr. Underwood said he hoped Mr. Dartt would present the balance of the report and have it read. He was entitled to that.

President Smith said a motion to that effect would not be necessary.

Mr. Harris stated that the delegates in attendance at the meeting of the Wisconsin Horticultural Society would be prepared to report at the proper time. He understood that an arrangement was made some two years ago providing for an exchange of reports with the societies in that state and Iowa. He inquired if any present had received such reports.

Mr. Dartt. I think I have received the Iowa report.

President Smith. Personally I should like to have copies of those reports; a great many of our members would like them. Think fifty copies was the number agreed upon.

Mr. Harris. I don't remember the number. The Wisconsin society do not get as many copies from the State as we do, but I think they agreed to send us twenty copies if they could do so.

Mr. Peterson. I received one of them.

Mr. Tuttle. The understanding was that we would exchange reports with Iowa and Minnesota this last year. Our report is embodied in the State Agricultural Society's report and some ten thousand copies of that were printed, being a volume of some eight hundred pages. I suppose, if they have none of the small reports to spare, they could furnish the other which embodies the same report.

Mr. Whipple. I would inquire if anybody knows how many of our reports have been sent out.

President Smith. Our secretary's report does not show the number, and we have nothing here that shows our membership except the printed reports.

Mr. Smith moved that the secretary be requested to ascertain what could be done towards an exchange of reports with other state societies, and to get as many copies for distribution among members as could be obtained consistently.

Mr. Harris. Iowa and Michigan only agreed to send enough to supply the officers and the executive committee. For two years past I have received none from Michigan and none from Iowa only by sending for a copy. Our reports have gone away by the hundreds. I hope some record may be kept of their distribution in future.

President Smith. I ordered one hundred copies from the State printer and fifty of those went to the German Horticultural Society here, and what are left I will bring up.

Mr. Harris. The State Agricultural Society are entitled to one hundred copies, as well as members of the legislature each a copy, but if these are provided it will bankrupt the society of

all our spare reports. We shall have to be a little more careful how they go in future.

The meeting was then adjourned till 9 o'clock A. M., January 21st.

MORNING SESSION.

SECOND DAY, WEDNESDAY, JAN. 21, 1885.

REPORTS OF DELEGATES TO WISCONSIN MEETING.

The meeting was called to order at 9 o'clock, Tuesday morning by President Smith.

Mr. J. S. Harris, of La Crescent, and A. W. Sias, of Rochester, delegates to the Annual Meeting of the Wisconsin State Horticultural Society, were invited to present their report.

Mr. Sias then read the following report:

REPORT OF DELEGATE TO THE WISCONSIN STATE HORTICULTURAL SOCIETY.

BY A. W. SIAS.

Mr. President and Members:

We deem it a high compliment to say of a speaker or writer that he is a man who does his own thinking. But I believe there are times in the experience of every person when it is highly proper, wise, and it conserves the best interests of all the parties concerned to let others do your thinking for you. Your delegate to Madison last February, when he reached the capitol and found both ex-President Harris and Secretary Gibbs there, felt that he was in just the position to take life easy and enjoy himself, and that if he could only manage to keep his mouth shut the Minnesota State Horticultural Society would be ably represented. In this conclusion he was not disappointed. On my way to Madison I made three visits, that were both delightful and instructive, viz.: at O. M. Lord's, Minnesota City, where we find some of the best native plums in the State; J. S. Harris,

La Crescent, where we find one of the oldest orchards in the State, and the one that produced the fruit that carried off the most blue ribbons, and lastly at E. Wilcox & Sons, La Crosse, where we first found Moor's Arctic Plum (and many other good things).

Dr. T. H. Haskins, Newport, Vt., writes me under date of Dec. 24, 1884: "I should think Moore's Arctic would be a bonanza to you. It is a *fact* (why, I don't understand,) that the curculio does not touch the fruit of Moore's Arctic, though they absolutely riddle the red plums alongside. I never saw a single curculio mark on a Moore's Arctic plum, and I eat them by the peck. Still it is so strange, that I should not be surprised to hear that they go for them elsewhere. Yet they say the same as I do of them in Northern Maine where they originated, and in the adjoining province of New Brunswick, where one man (F. P. Sharp, of Woodstock,) shipped 2,000 bushels last year." We reached Madison late in the night, and put up at the Capitol House, where we found first-class accommodations and courteous treatment. After enjoying a well-prepared breakfast we reached the horticultural rooms before the convention was called to order, and enjoyed the pleasure of renewing our acquaintance with the veterans of Wisconsin's pomology, viz.: J. M. Smith, of Green Bay; A. G. Tuttle, of Baraboo; J. C. Plumb, and others. Soon after the convention was called to order by Pres. J. M. Smith, the Minnesota representatives were elected honorary members and invited to take part in the discussions, which they proceeded to do, with the exception perhaps of your "modest member," whose silence was no doubt thought to be grand. At the close of the morning session we were taken in charge by A. G. Tuttle for the balance of our stay in Madison and most royally entertained. The only exception to this was during the afternoon session of the last day of the convention, when Secretary Wm. Trelease invited the Minnesota representatives, Pres. Smith, Hon. M. Anderson, B. S. Hoxsie and others to take tea with him at his private residence in the city. This was an enjoyable occasion. Prof. Trelease and his amiable wife know how to entertain such a party in right royal style. One object is, and of right should be, in sending delegates to other societies to compare notes, and keep up a friendly interchange of practical ideas and business relations. Keeping this in view, and believing, in Minnesota at least, the apple to be the fruit of all fruit for our climate, I could conceive of nothing that I could

do for our State and society, during my short stay among the horticulturists of Wisconsin, better than to make a *special* study of winter apples, and present to you in my report a list of at least half a dozen each of the most promising native and foreign sorts, and in order to make this list as complete and accurate as possible, considering the short time we have any of us had to test some of these new varieties. I have since my return from Madison, corresponded on the subject with such well known practical fruit-growers as Chas. Gibb, of Abbottsford, Pro. Que.; Dr. Haskins and A. Webster of Vermont, F. K. Phoenix and Tuttle of Wisconsin, and Peter M. Gideon of our State. In presenting my list of native sorts, I shall confine myself to what are believed to be Wisconsin seedlings, namely: Wolf River, McMahan White, Giant Swaar, N. W. Greening, and a sweet and sour seedling by A. J. Philips and exhibited before this convention by him two years ago at Minneapolis. These are all large and of good quality, and winter varieties at least north of latitude 44°.

Of the foreign varieties, will say that out of six that we applied to for a list of half a dozen winter sorts, (and they are among the most extensive growers of foreign fruits in this country,) only one ventured a full list; the others run from three down to zero. I will give this full list just as received. It is from A. Webster, of Vermont, and I have no doubt of its correctness for his location, but I venture the prediction that not over one-half the list will prove to be winter here. It is evident from the writings of Dr. Haskins and others that fruit keeps longer in Northern Vermont than with us. Here is Mr. Webster's list of the six best Russians, viz.: Little Seedling, Borsdorf, Longfield, German Calville, Blackwood and Russian Gravenstien. One of my most trusty correspondents on this interesting subject writes: "Your question as to what are the best six Russian apples for Minnesota, I am not able to say. It is 'the difficult question' and I am afraid to venture. It, however, will not be long before we know something about it."

My answers were all highly satisfactory, and show conclusively that we have able, honest workers on this foreign fruit list, and when they *do* give us a winter list for Minnesota it will be neither summer nor fall, nor *too tender*. I'm told that during the night of January 1st, of the present month, spirit thermometers in the lower part of our city indicated 52° below zero. My thoughts at once recurred to my Iron Clad Russians, and my sleep has been

just as sound ever since. On our return from the convention we laid over one day to visit our friend and co-laborer, A. G. Tuttle, of Baraboo, and during our exceedingly pleasant and profitable sojourn, we were instructed by Mr. Tuttle how to wind root grafts without wax, and you may not all be familiar with this mode of winding, which saves time and expense. I will try to explain it here. He tongue-grafted in the usual manner, winding the unwaxed yarn, which is light and sleazy enough to break easy, twice about the base of the union, and then same number of times around the top, then drew the yarn between the cion and top of the root and broke it off. We wound about 20,000 in this way last winter and never had grafts do better.

Apples best adapted to Wisconsin,—revised list,—hardiness, productiveness and quality taken into consideration: Duchess, Wealthy, Pewaukee, Fameuse, Plumb's Cider, Talman Sweet, Wolf River.

Crab apples for general cultivation,—Whitney No. 20. Gibb, Hyslop, Sweet Russet, Transcendent.

The cultivation of small fruits in Wisconsin is so similar to our own that I will not trespass upon your time in considering it.

Evergreens for general cultivation,—Norway Spruce, White Pine, Arbor Vitæ, Scotch Pine, Balsam and White Spruce.

The Wisconsin Horticultural Society was organized a year previous to our own, viz.: in 1865. Let us now compare their three banner counties with a like number of ours, and see how we stand on the most *interesting, profitable and vital* subject that can ever properly come before a convention of horticulturalists, viz.: that of *seedlings*:

First—Will name Waupaca County, the home of the Wolf River and other popular varieties.

Second—La Crosse County, the home of our esteemed member A. J. Philips, who showed us such large, fine winter seedlings two years ago at Minneapolis.

Third—Waukesha County, the home of the Pewaukee, and other new seedlings, showing that the *resurrection* of Geo. P. Peffer was no unimportant event in the history of the State.

Banner counties for Minnesota, viz.:

First—Hennepin, the home of the famous Wealthy, and many other noble seedlings.

Second—Olmsted, where the Brett seedlings were born, and first introduced to public notice by myself, at the annual meet-

ing of the Olmsted County Horticultural Society, in December, 1883, and mentioned in my report on seedlings before this society a year ago. Also the Forster seedlings that took the first prize from this society two years ago. And the Waldron seedlings from the Fameuse now on exhibition that I wish to call your attention to at this time.

Third—Wabash County, the best known of which is the Rollins varieties; Rollins Pippin, Elgin Beauty, and many other hardy winter sorts.

In the hasty comparisons here made between the new fruits of Wisconsin and Minnesota, we have no desire to even intimate which State has done the most for the Northwest till we know what effect 54° below zero has on them.

Mr. Harris then read the following report:

WINTER MEETING OF THE STATE HORTICULTURAL SOCIETY OF WISCONSIN.

BY JOHN S. HARRIS.

It was my privilege to receive a special invitation to accompany our mutual friend Mr. Sias, upon his silver wedding tour the first week in February last, and as the thoroughly alive and immensely popular railroad company, the Northwestern, through their genial superintendent, Mr. S. Sanborn, seconded the invitation with free transportation over their road from Winona to Madison and return, and I had learned that Mr. Sias carried letters of introduction to some of the notables, I gladly availed myself of the privilege of being bridesmaid for the occasion, and I assure you I shall never regret doing so. As he has furnished you with a good report of the tour, I had resolved to remain silent upon the subject, but the resolution has been rescinded by a unanimous vote, so I have concluded to write you a letter about it which you need not print unless you want to.

We boarded the east-bound train over the Northwestern at Onolaska, a little burgh about six miles from La Crosse, on the evening of the fourth, and the gentlemanly conductor soon found us and said we were the chaps he was looking for, and he served some very pleasant papers upon us, and offered me the freedom of his castle. Upon looking about we found the coach a very elegant one, and well lighted and warmed, and the road bed

smooth and pleasant to glide over. We reached Madison about midnight, and were so honorably entertained at the Capitol House that we should like to stop there again. We awoke on the morning of the fifth to find the beautiful city of Madison full to running over with live farmers. After breakfast we hied away to the halls of legislation, and there a grand sight awaited us. From four to five hundred farmers and sons of toil had taken possession of the seats so wisely occupied by lawmakers and the political shysters that stick to them—as does the bark louse to our apple trees—as long as there is any blood left that can be drawn. They had come not to engage in a woodchuck hunt, but to discuss the most momentous questions of the day, and to devise means for raising better stock and growing more and better crops, thereby adding to the wealth and prosperity of the State. Was this sacrilege? The representative farmers had gathered in from various parts of the State and temporarily taken possession of their own. All seemed able and willing to impart information and to receive it, too, and for four days the halls of legislation were filled with oratory, and echoed to honest eloquence and appeals of sound sense. They seemed to say

“These are the hands whose sturdy labor brings
The peasants food, the golden pomp of kings;
This is the scholar, whose immortal pen
Spells the first lesson hunger taught to men.”

The State Agricultural Society, the State Horticultural Society, the State Cane Growers, Dairymen and other associations were holding their annual meetings simultaneously. The concentration of so many meetings in one week of societies having kindred interests and being component parts of a great whole, the beautiful temple of agriculture, probably brought together a larger representation of each than either one could have secured had the meetings been held at different dates. All of the meetings except the State Horticultural Society came under the program of the State Agricultural Society, and Secretary Babbitt's long and well arranged order of business gave each a portion of time for bringing out valuable and interesting papers and discussions. Now, I do not believe that Wisconsin is favored with any better farmers, or those who are more capable of arranging and presenting their ideas in a manner calculated to benefit the people and build up agricultural societies than is Minnesota. But these papers and discussions are collected to-

gether and published and substantially bound in the annual transactions of the society, making a volume of great value to those who are fortunate enough to receive them. The legislature of Wisconsin is liberal toward agriculture, and the governor, Mr. Rusk, honored the session with his presence, and in a few well-timed remarks assured the farmers that all they had to do was to make their wishes known and they would be complied with; that Wisconsin being an agricultural state the farmers could select such members to the legislature as they chose, and that no governor would dare to veto any measure that has their indorsement. He seemed to believe that though

“The king may rule o’er land and sea,
The lord may live right royally,
The soldier ride in pomp and pride,
The sailor roam o’er ocean wide,
But this or that, whate’er befall
The farmer, he must feed them all.”

and therefore his rights were the first that should be respected.

The legislature of 1883 authorized the publication at the expense of the State of 12,000 copies of the transactions of the State Agricultural Society, 12,000 of the State Horticultural Society, 12,000 of the State Dairymen’s Association, and 12,000 reports of the Agricultural Department of the State University. The whole may aggregate nine hundred and fifty pages. Eleven thousand five hundred volumes of each are to be bound together in cloth, and five hundred copies of each separately for the members as exchanges of individual societies. When will the farmers of Minnesota awake to the importance of their calling, and proceed to demand their honest rights, and brand every legislator with infamy who dares to oppose their receiving a like grant?

Considerable time was spent in discussing the management of the agricultural department of the State University, and there seems to be a growing feeling among the farmers in favor of separating the Agricultural College from the University of the State. The State Horticultural Society has enrolled among its members some of the ablest men of the State—men who are thoroughly awake to the importance of successful fruit growing and rural adornment. In years previous their annual conventions have been held in joint sessions with the Agricultural Society, but this year, through some misunderstanding, their meetings were separate, and they found themselves called together

without a program for the occasion. However, the time was fully and pleasantly occupied with the routine business of the society, sandwiched in with volunteer speeches and congratulations upon the condition and progress of horticulture, and the reports of delegates who had attended the meetings of other societies and the late meeting of the Mississippi Valley Horticultural Society. One evening session was devoted to the discussion of the future of apple culture in the more unfavored regions of the Northwest. Messrs. Gibbs, Sims, Tuttle, Pepper, Plumb, Kelley, and others took an active part in the discussion, and the opinion of the older and best horticulturalists seemed to be that the late tour for observation in Northern Europe by Hon. Charles Gibb, of Canada, and J. L. Budd, of Iowa, would prove a great help in solving the great question, but that in all probability, the varieties brought from Russia would not supply a sufficient number of varieties that would prove adapted to all localities and situations, and that the future tree would yet be originated upon our own soil, either from seeds of the best Russians or our best natives, or an intermarrying between the two. The interesting papers read before the meeting were: "The Cultivation of Chestnuts Above Forty Degrees North Latitude," by A. S. Benedict, of Weyauwega; "Fruit-Growing in Florida," by J. S. Stickney, of Wauwatosa; "Russian Apples," by A. G. Tuttle, of Baraboo; "Blight on Apple Trees," by George P. Pepper; and "The Flower Mission," by Mrs. H. M. Lewis, of Madison. The latter was a very interesting paper, showing the workings of the most beautiful of all charities in the distribution of flowers to the inmates of hospitals, charitable institutions, the sick and poor in their homes, and the inmates of jails and reformatory institutions. The society receives but six hundred dollars per annum aid from the State, and the working members are scattered over a wide extent of country, making it much more costly than with us, to defray the expenses of summer meetings, which they locate in parts of the State where they may accomplish the most good, and they expend much larger sums than we do in payment of premiums for the exhibition of horticultural products. The election of officers resulted in the choice of J. M. Smith, of Green Bay, for president, and Mrs. H. M. Lewis, of Madison, for Secretary.

After the adjournment of the Horticultural Society, we accepted an invitation from Mr. A. G. Tuttle to spend a day in looking over and examining the apple trees in his extensive

orchards and nurseries near the beautiful city of Baraboo. Mr. Tuttle's place is the headquarters for Russian apples in the Northwest, he having been the first to get a start in those hardy varieties, through the Hon. C. M. Clay, when he was United States consul at St. Petersburg, Russia. Mr. Tuttle has about one hundred varieties, two trees of each set in orchard, of which about fifty have fruited. A few of them he considers very fine, and thinks that after further trial we may reasonably hope to be able to select from them a half dozen or more varieties that will prove of great value for planting in trying localities. The trees of most of the varieties exhibit marks of great hardiness and adaptability for this climate, and it may be well for us to keep a watch of their conduct in the future.

We had a good time, and our thanks are due to President Smith and the old war horses of the Horticultural Society for making our stay in Madison so pleasant; also to President Fratt and Secretary Babbitt of the Agricultural Society, and Profs. Henry and Trelease, of the State University, for their many courtesies shown us.

DISCUSSION OF REPORTS.

President Smith. You have heard the reports read; are there any remarks to be made upon them? They will be received and published with our proceedings unless otherwise ordered.

Mr. Harris. I would like to state that the snow was pretty deep at the time we were at Mr. Tuttle's place and it was rather difficult getting around in his orchard. Mr. Tuttle is not a very tall man but he managed to break the snow down pretty well. We examined his trees and I must say that the majority of them do look remarkably well. He took a hatchet with him but showed good will towards us. Whenever there was any variety that he wanted to find out if it had been injured why down came a tree. He was cutting them so savagely that we almost felt like asking him to forbear, and we were satisfied to take a few specimens. The trees that he cut we generally found sound in the heart. I found one which I examined more carefully after getting home which I thought showed marks of injury; I thought by the appearance, by the winter before or blight,—I think it was the blight. I have no doubt there are many varieties valuable to plant in trying situations, but I think there is scarcely any variety we can find that comes from Russia that will be per-

fectly adapted to planting everywhere. A tree that might do well in a narrow valley might do nothing on the prairie. Another variety that in one locality might produce fine fruit might on the prairie be worthless. We must not jump at conclusions in this thing and we should not urge every farmer to go and purchase all those varieties, but we must experiment and we should give information as soon as we get it. They can help us in solving the question and help us to find something that will be of value to all our people. Perhaps we cannot find enough of them. The Duchess has stood by us. If we cannot do this we want to do another thing which is the planting of seed. I have had occasion to notice this of late: Many people come to my place and I frequently give away nice looking apples; I find people will eat a good apple, save the seed, carry them home and I suppose they plant them. Now, if every man who eats a Minnesota apple which is comparatively hardy, will take care of the seed and plant them, the time is not very far away when some one will hit upon something which may perhaps be better than the Wealthy. If not he will hit upon something of value. There are places where the Wealthy blights and the time is not far off when we shall get much good from the planting of seed and raising trees from them.

Mr. Smith. Mr. President, in relation to those seedlings mentioned here, I have a suggestion to make. I don't know that it is practical, but I think we ought to make some arrangement by which we could bring this matter more directly before the people of this State; so I put this out in this way, and it can be modified, changed or rejected. I move the appointment of a committee of three to collect all the information possible in regard to the best Minnesota seedlings, with a statement of where the varieties are for sale and at what price; that 10,000 copies of a circular containing this information be printed and scattered throughout the State, wherever it is thought they will do the most good; that the press of the Northwest be requested to give this as wide a circulation as possible, and that the expense to the society shall not exceed \$50. My reasons for this are, first, that the Rollins Pippin has been before the people of Minnesota for a good many years, and very few people are planting it, and yet I believe it to be worthy of cultivation anywhere in Minnesota; the same may be said in regard to many Minnesota seedlings of merit. They have not been brought before the people. Now, the nurserymen are, perhaps, propagating them on a small scale,

but they do not push their trees on the public, consequently the trees are not sold.

Again, there are men canvassing all over the State with something that they represent as being a new seedling; sometimes it is good for something, but generally it is good for nothing, and usually the farmers who buy and pay out their money are disgusted with that sort of work and do not want to buy any more. Now, then, if we can get some information that is reliable, and attach the names of reliable men to the statements sent out (and we have got them) that they have such stock for sale, the people will know where to buy; they will know that they are getting a good article, and I think that something in this direction might be done that would stimulate the planting of fruit trees in this State very much.

Mr. Dartt. Mr. President, in order that too much time may not be consumed I would move that in all discussions persons be confined to five minutes time, and to one speech upon a question until all have spoken who wish, and two speeches be allowed by consent of the society.

Mr. Pearce. I think that is a standing rule in this society.

The President. No; I think it is not.

The motion of Mr. Dartt was seconded and adopted.

The motion of Mr. Smith was seconded.

Mr. Dartt. This question of satisfying the people as to what is reliable for them to plant is in my opinion a very important one. If we could say to the people all over the State everywhere, there are varieties of standard apples that you can grow successfully, and say it with truth, it would be worth a great deal to the people. The trouble is we have said so much to the people, we have told them so many things that they could do that they have tried to do and failed, that they are inclined to believe either that we don't mean what we say or else that we don't know what we say. Now, then, our list of apples — take the whole list that we are growing in Minnesota — there is not in my opinion three apples well known that can be grown in the unfavorable sections of this State. I think there is a large number that can be grown successfully in the favorable sections; they can be grown up and down the Mississippi Valley, at Excelsior and in this favorable region, but when you go back where the general lay of the country is about four or five hundred feet higher than it is here, with no water to soften the atmosphere, we find a failure. I cannot grow the Wealthy successfully. I

don't believe it can be grown successfully in Steele County; many have tried it there and failed, and the same is true of nearly all these varieties that you grow in the Mississippi Valley. And so it has been with nearly all the Wisconsin varieties; I have tried lots of them. I was there and staid a good while, and I have tried the hardiest I could find, but "death was their portion." They couldn't stand Minnesota. I expect we shall probably get something out of these Russians, something that will stand. What I desire is that the State shall be districted according to its fruit-producing abilities into districts; those districts favorably located — let those sections be by themselves, and the others by themselves. I would like to see the Iowa plan of directors adopted and have one director for each section, that director to have the oversight of his territory, and he be expected to report everything good, and as far as necessary, everything bad.

Mr. Underwood. Mr. President, there is already provided, I think, by the articles of our society something that answers that purpose; I don't know but it enters into the constitution — a provision for a seedling fruit committee. Perhaps it would not be necessary to have two seedling committees, but if it is thought best to give the committee any special work to do to more accurately define what their work shall be, it seems to me that might be done and let that answer. I think, so far, the seedling committee have simply been chosen and allowed to go on without any instructions at all, and they have not accomplished as much perhaps as they might have done if working under instructions. I suggest that it is not necessary to have two seedling committees.

Mr. Pearce. At our last meeting this question was discussed pretty thoroughly, and some of our friends are apt to forget some things. There are now experimental stations located all over the State for the purpose of making tests of fruit, and I think I have one hundred varieties. It rather strikes me that seedlings are looked up more closely in this State than in other states. All we have to do is to see that the committee on seedlings do their duty. And I know that they are trying to do it; I know that there have been seedlings sent to every station so far as it could be done. I know I have had seedlings until I have got tired of them. So far as the necessity of having this matter looked up, I must say that I think it is being very thoroughly done. There is my friend Sias who is making good progress,

and here is Mr. Underwood. Not only the experimental stations are used, but there are orchardists all over the country who are at it, and I venture to say that within three years we can purchase five hundred new seedlings without any effort at all. If any better means can be devised I would like to see it introduced. I am opposed to committees because they sometimes clash together. We have seedling committees and they are to make a report here.

Mr. Sias. Before the discussion on seedlings, would it not be well to call for the report of the Seedling Committee?

Mr. Smith. With the consent of the second I will withdraw that part of my motion that a committee be appointed on seedlings and move instead that the Seedling Committee be instructed, etc.

Mr. Shannon. I think there are perhaps others like myself who live out in the western part of the State and are not very thoroughly informed as to these new varieties. It seems to me this information in regard to seedlings ought to be very widely distributed. In the country where I live I think I am visited by about every fruit man that comes through the country; and I find that no two men sell the same trees. They all make a specialty of something and generally the speciality amounts to nothing. If information could be sent out on which the people could rely it seems to me it would be of great benefit. They will buy everything that comes along when they see the cut of the fruit, not knowing what they are buying, and as a rule it amounts to nothing.

Mr. Harris. We established a standing committee on seedling fruits either in '80 or '81; and the next year there was some discussion on the subject and a vote taken by the society that it should be the duty of the Seedling Committee, when they heard of anything that would apparently be promising, to go out and examine and report upon it, their actual expenses in going and coming to be paid by the society, and we should act on such information. I think it was designated what territory we should go over; and that was the arrangement for two years; I think it will be found in the report of our transactions. I believe some members of the Seedling Committee are present and are ready to report if called upon.

President Smith. Perhaps we had better hear their report before taking definite action.

Pending the report of the Seedling Committee the resolution was laid on the table.

On motion of Mr. Smith the report of the committee was called for.

REPORT OF SEEDLING COMMITTEE.

Mr. Underwood. Mr. President, I have no prepared written report. Of course we are doing all we can and doing a good deal to develop new seedlings, which we hope will result in good to the people of the State of Minnesota; but it is impossible in one year, two, three, or more years to bring out any new variety and be prepared to recommend it and say that it is hardy, a good and desirable apple in every respect, and one that we can recommend the society to adopt. I have a seedling on exhibition here that is growing in the southern part of the State which has been brought to the notice of the society several times; and while we have been following it up to see what it is doing, at the same time we don't feel justified in saying it is one of the desirable seedlings that the society should recommend. And there are very many of these experiments that must necessarily take time; the society cannot expect that the Seedling Committee are to take the cions they have received and send them out labeled as hardy, good keepers and all that is desirable. I think very likely all the other members of the committee have met with the same experience, if they have been able to develop anything really reliable and of value. Just as fast as we get information that is reliable we are ready to report. I have no doubt you will trust a nurseryman to let it be known when he finds anything that is worthy of notice to announce the fact, and he will be very likely to post our friends in other parts of the State and try to sell them some of the trees. I have a great deal of faith in the results that will accrue to the State in the development of new seedlings. We are continually being importuned to take up new seedlings that perhaps some man has on his farm and which he says is just as hardy as an oak, is a splendid keeper and the best apple he ever eat; but under our management they don't always turn out just what they have been represented to us. And when we go to visit the trees sometimes we find they are an old variety that has been grafted for many years. It seems to me it will be several years yet before, as experimental stations, we shall be able to give to you anything that is thoroughly

reliable. We certainly have already enough that may be considered a good deal of an experiment which we don't know very much about. I could talk to you for perhaps half a day about the things that I don't know anything about but that is not the information you are seeking. We have a good many of these new seedlings, top-worked and root-grafted, also Russian varieties, and just as fast as we can develop them and bring them before the society we shall be very glad to do so.

Mr. Pearce. I am a member of that committee. I have no written report to make; but I would state that I procured cions from different parts of the State. I received a good many from our secretary, Mr. Gibbs, that he sent me. I grafted those. I also received a number of varieties from northern Nebraska, that originated there. There is one large, sweet apple—I think it is called the Longnecker; from the growth made last season, and the condition of the wood early in the fall, so perfectly ripened up, I am rather inclined to think it is going to prove hardy. Also received another, a winter variety and a Western apple, resembling the Ben Davis—full as large—known as the Eureka Imperial. At the Kansas exhibition it was the finest apple there, probably, out of two or three hundred varieties. I was so much pleased with the apple that I procured cions enough to graft two or three hundred roots. They have made a beautiful growth. They don't ripen so well as the other. I didn't put the cions out until late, and I cannot say about that. I also received an apple from northern Ohio; one that is cracked up there. I have not the name with me. It also ripened splendidly. I got a lot of those and grafted them. I have also received different Russian varieties; some ten or a dozen; supposed to be the very best. I top-worked and root-grafted them, and they have also done well. Also have a number of other varieties, that I really don't know what their names are. They were sent me from different parts of the State, promiscuously. Half of them came without names. They are doing well. We cannot tell anything about them until another year. There is a seedling that is growing on my grounds that I think is going to be a good early apple. It was supposed to be a Duchess. It looked like the Duchess; but last season it fruited, and it was quite a different thing altogether. It is a nice apple: red, medium-sized and exceedingly early—at least two weeks earlier than the Duchess. I brought a few of them here to the fair, and they were such a nice tasting apple they were soon “gobbled up,” and I saw no more of them. But

they were pronounced to be excellent. The tree, I think, is perfectly hardy. It looks like the Duchess, but ripens sooner. Col. Stevens saw it, and was much pleased with it. I procured cions enough from the tree, which is about eight years old, to put out a thousand more. I cannot report more fully. I shall take good care of all these seedlings, every one. I shall send specimens of fruit to those who are judges, and will give the trees a fair test. I had about a barrel of these apples, but the boys got ahead of me this year. They didn't know, I think, that I knew anything about the tree. Another year, if I can possibly save them, I will send those apples around. Am in hopes it will prove to be a good early apple, that will come right in at the time we want it. I shall notice those varieties closely, each one. I will report and exhibit the fruit as they come in bearing.

Mr. Sias, being called upon, presented a report upon a blank form, as follows:

REPORT FROM ROCHESTER DISTRICT.

To the Managers of Seedling Experimental Stations:

GENTLEMEN—In order to conduct our experiments and report them in a uniform manner to the Society, the following blank is adopted, upon which you are to make reports at each annual meeting:

NAME OR NUMBER.	Year Set.	No. cions or buds received.	No. Set.	Stock Used.	Location.	Soil.	Growth.	Quality.	Color.	Season.	REMARKS.
240—Lieby	1884	2	4	Hybrid.....	High N. Slope.	Clay Loam.	Strong	.....	Striped	Fall.	Cions set in spring of '84. Have fruited 240 for past 6 yrs. Qual. 2d or 3d rate.
262—Charlamoff	1884	1	3	" .....	" "	"	"	.....	.....	.....	Have Hibernial ten yrs. old on Hislop crab; no fruit yet.
378—Hibernial.....	1884	2	5	Russian	" "	"	Fair....	.....	.....	.....	"A failure on sour stocks," says Chas. Ludluff; "and we have no sweet cherries in this locality."
472—Ostrekoft's Glass...	1884	2	4	Seedling	" "	"	Dead ..	.....	.....	.....	.....
Cherry—Ostheim	1884	5	14	May Duke and Bird Cherry...	" "	"	"	.....	.....	.....	.....
Red Plum	1884	4	12	Wild Plum.....	" "	"	"	.....	.....	.....	.....
Wright's Sweet	1884	4	10	Hybrid.....	" "	"	Mod'te.	.....	.....	.....	.....
Wright's Belleflower	1884	4	10	" .....	" "	"	"	.....	.....	.....	.....
German Rambo.....	1884	4	11	"	" "	"	Fair....	.....	.....	.....	.....
Robinson's Seedling	1884	4	10	" .....	" "	"	"	.....	.....	.....	.....
Reinbecker	1884	4	12	" .....	" "	"	"	.....	.....	.....	.....
Hart Seedling—Spring of	1884	24	75	" four sorts	" "	"	Heavy..	Good.	Red & Yellow..	.....	Five of these cions bloomed same season grafted.
Longfield	1884	12	36	"	" "	"	Mod'te.	.....	.....	.....	Of E. W. Daniels, at Madison, last Feb.
N. W. Greening.....	1884	6	18	" .....	" "	"	"	.....	.....	.....	.....

About fifty varieties were put on trial last spring, including Pears Eastern Belle and Clapp's Favorite.

ROCHESTER, Minn., Jan. 17, 1885.

A. W. SIA S.

Mr. Sias made the following written report :

REPORT OF SEEDLING FRUIT COMMITTEE.

ROCHESTER DISTRICT.

I shall speak first of what now appears to be one of the most promising new seedlings in the State, viz., the Brett Seedlings of Dover, Olmsted County. These seedlings were first exhibited at the Southern Minnesota fair in September last, and took two first premiums. Next at the State fair at Owatonna, where they were entered as the best collection of seedlings, and took the first premium of ten dollars. Here they had a large display of fine seedlings to compete with. Mr. J. W. Hart, the present owner of these seedlings, has made arrangements with me to propagate them and to enter them for the prize of \$1,000 in his name. Will say that I made a visit to these trees for the first time in December, 1883, and again in August, 1884, at which time three of them were well loaded with fruit. I next visited them in September last in company with J. S. Harris. These trees all appear very hardy and of good quality. I took plates of each and sent them to Minneapolis to be put in cold storage till time to ship to New Orleans; also a plate of each for our exhibit here, but after carrying them twenty miles in a wagon, and then keeping them in a damp, mouldy cellar till this time, I find them now in poor condition to exhibit. But we have a specimen of the wood and leaf here that will doubtless prove satisfactory to all. The originator of these fine seedlings and his noble wife celebrated their golden wedding about a year ago, and will very soon pass over the River. But these hardy fruits will doubtless be continued through their cions for hundreds of years to perpetuate their memory. One is named Hart, in honor of the owner; one May, in honor of Mrs. Mary Brett, who planted the seed; the other Brett. We have still another that we think especially fine and probably the largest, but as this did not bear the past season we concluded to wait for further developments before describing. I have a letter here that I desire to go into this report, by Mr. C. H. Brett himself, describing these fruits, that I will read if you so wish.

“STRONG, MAINE, Feb. 28, 1884.

“ Your letter to me in regard to the history of the seedling apple trees on my old farm in Dover was sent to me at this place the last of January, too late for your report.

"In the winter of 1872, I bought a barrel of apples of Mr. Harroon, south of Dover; you may know where he lived; he had a large orchard of good fruit. The barrel I had was the Talman Sweets and Gray Russets, mixed. My wife saved quite a quantity of the seeds, planted them in a box of earth and in the spring of 1873 I transplanted the pips in the best of earth; most of them did not survive the rigors of the cold winters, but four trees came out all right. One bore fine apples the seventh year, none since. The best one had blossoms the eighth year, bore a few apples the ninth; in 1882 bore one and one half bushels of as handsome apples as I ever saw, very large, red, shaped like the Harvey, flat at the poles, not too much so. One other bore the same year one pail full, good sized, longer, color like the Rhode Island Greening. The best tree in full bearing was the admiration of all that saw it, and there were many called to see the sight. The fruit is flavored like the Baldwin; it is not a winter apple but late fall. Everyone that saw it wanted grafts from it. Had I kept the farm should have used the grafts extensively. I do not know what the fruit was last year; Mr. Hart will inform you.

"The apple I call 'Brett's Seedling' (mark this,) never showed the least suffering from any winter since it was a pip; examine the body and you will see the bark is the right color, perfectly clean.

Yours truly,

C. H. BRETT."

The Waldron seedlings originated in the town of Cascade four miles west of Rochester by Robert Waldron, who died the present month, aged about seventy-five years. I visited him about the first of October; his seedling trees were then well loaded with fruit. He helped me put up a good show for New Orleans and for this meeting. I have never grafted any of these seedlings (from the Fameuse), but believe them worthy of trial. The Forster seedlings that took the first premium at our winter meeting two years ago should claim a share of our attention. Mr. M. W. Cook showed me the fruit and wood of a seedling that he says originated in the township of Rochester and bore very heavily the past season. I should have been glad to have visited this tree so as to give a more full report, but just the particular location of this wonderful seedling is at present a profound secret. But among the older seedlings of this section of country I find nothing for winter that suits me much better for quality, or much

more of an Iron Clad than the Rollins Pippin. The Giant Swaar is generally supposed to be a seedling of Olmsted County, but I am sorry to say it is not. It was brought into this county when it was a yearling from Wisconsin, and first fruited by John R. Williams of Viola township. The last of these hard working pioneer seedling growers will soon disappear, but they will be kindly remembered by succeeding generations, who follow to enjoy their fruits. But I must say in justice to our friend Peter M. Gideon that, after all that has been said, it remains a mooted question whether, all things considered, there is anything to successfully compete with the seedlings of Hennepin County.

A. W. SIAS.

Mr. Sias stated, in regard to the Brett seedling, that the variety stands upon the recommendation of the originator, Mr. C. H. Brett, of Mankato, who has no personal interest in the matter at all, having sold the place where they were originated some two years ago. He said he did not wish to recommend them himself at present.

Mr. Sias. I will say that Mr. Brett is getting to be pretty old and does not write a very plain hand. I would say, also, that I am acquainted with Mr. Harroon, whose farm is south of the village of Dover, and think I sold him the trees that bore the apples that Mr. Brett bought. It is called the Gray Russet, but I think it must have been the Golden Russet. It resembles the Gray Russet very closely. His Russets are mostly the Golden Russet. In regard to the Waldron seedling, I would say that Mr. Waldron, who originated it, died during the present month, aged about seventy-five years. I visited Mr. Waldron about the first of last October, and at that time his seedling trees were still loaded with fruit. He helped me to get a good show of fruit for the exhibit at New Orleans and for this meeting. He stated that he thought the seedlings were from the Fameuse. The Forster seedling should claim a share of our attention.

Mr. A. Peterson, of Waconia. I had not intended to report, but will make a short report as my friend from Carver County has done so. There is a seedling in that county which promises well. I have not seen the tree for two years, but I heard last fall that it was as sound as ever, and the fruit three years ago kept until March; it is not extra quality and is of medium size. There is another seedling and a sample was brought here of the fruit; but I don't believe the tree is hardy enough for our climate up there. That is all that I could say about seedlings.

Mr. Harris. Mr. President, these reports have come from members of the seedling committee as well as from our experimental stations. We are so young in the business that I fear we cannot give you anything in the line of a written report that will be very valuable. As manager of a station I have done what I could. I have received a very few seedlings and put them in, and am making preparations so that I can make actual tests of any new seedling or variety that shall be sent me. I have set aside a piece of ground and intend to devote it exclusively to experimental work for the benefit of the Horticultural Society. We did not expect when this committee was appointed that we could go out in one year and gather up those seedlings which should be adapted to the wants of the whole country, but we did hope to be able to originate varieties and bring the information we are seeking before the people much quicker than if the matter was left to itself. I believe that committee has made a report each year. My report is as follows:

REPORT OF JOHN S. HARRIS, MEMBER OF SEEDLING FRUIT COMMITTEE.

LA CRESCENT, Jan. 1, 1885.

To the President and Members of the Minnesota State Horticultural Society:

I have continued my observations in the line of horticulture and held myself in readiness to respond to every call to visit new seedlings, wherever the attending expense was not greater than the reduced condition of the society would warrant, and have met with encouraging success in finding varieties that promise to be worthy of looking after. At the State fair and at the fair of the Southern Minnesota Fair Association the exhibit of seedlings was much larger and finer than ever before made in the State and fully one hundred varieties were upon the exhibition tables. Many of them were fair in appearance and of excellent quality. The most notable exhibits at the State fair were J. W. Hart's, of Dover Center, three varieties of Brett's seedlings that were awarded the first premium as best collection; Jacob Kline, Union, Houston County, eighteen varieties, awarded second premium on collection and one of them the first as best autumn variety for all purposes; J. C. Kramer, La Crescent, five or six varieties; E. B. Jorden, Rochester, ten or a dozen; J. S. Harris & Son about the same, and many others with from one to ten

varieties. The three varieties of Mr. Hart that carried off the first prize impressed me so favorably that I secured the company of A. W. Sias to pay them a special visit and give the trees a personal examination. We judged the trees to be about fourteen years old and they were apparently sound and thrifty. Tree No. 1 is a strong symmetrical grower with round, perfect top. The fruit, of which there was several bushels, was large, showy and good. I judged it to be an autumn variety. Tree No. 2 branches more upright. Fruit large, medium quality, in my estimation better than No. 1; was carrying a good crop. No 3, fruit mostly gone and will not hazard an opinion on its merits. The ground color of all was deep green, striped or splashed with red and they doubtless are from the seed of one variety. I also visited some trees at Minnesota City. Jas. Wright's seedling, Belle Flower, was carrying a large crop and I believe the tree to be as healthy as any crab of its age (thirty-two years) in the State. The most extensive collection of seedlings I have found anywhere was on the farm of Mr. Burley, one and one-half miles above Minnesota City. I did not have an opportunity to test any of them or learn their history as Mr. Burley was away at the time of my call. There can hardly help but be something good among so many and I call your attention to them that they may be looked after in the future. I have called to examine the tree of Philip Eberhard, of Mound Prairie. It is reported to be twenty-eight years old, a regular annual bearer of a medium sized winter fruit that is a favorite with the family for cooking. Tree sound and thrifty. Also paid a visit to the trees upon the Geo. Hartman farm of Hokah. Found one tree, which I have mentioned in former reports, carrying a heavy crop of fruit and looking well. I have procured and planted the seeds from one-half bushel of the apples for use in my experimental station. I have examined several other trees in various localities and have received information of others that are spoken well of in their respective neighborhoods and shall arrange to see them at an early day. I consider the Seedling Fruit Committee to be a most important one and would recommend that this meeting set apart a certain sum of money to be expended in defraying its expenses or that it fix a limit to the annual expense that each member may incur in the discharge of duty. All of which is respectfully submitted.

President Smith. That completes the reports of the seedling committee. There is another report to be made here upon Russian varieties.

Mr. Underwood. Mr. President, with your permission I will supplement what I said in my report, which was not a written one, with a statement in regard to the seedling I mentioned. Now, I never like to talk very much about what the possibilities of life are; in fact, I don't have any time to look into the future; I don't care anything about the past, and I have very hard work to take care of the present.

Now, there is a seedling we are growing. Our friends are calling on the seedling committee to report, and want something practical, and they want us to tell them all about what to send out. I don't know of anything more that I can do after we have sent agents around to tell them what to do, and when we pay those agents a good salary to tell the people what to do I don't know why they should expect so much more of us. After all, I would just like to call attention to this seedling. I don't know whether it is worth anything, but you can see the fruit. I know this, that in the orchard where it grows it is on a southern exposure and a lot of seedling trees have been growing there in the grass for many years without any care at all. I thought that perhaps out of fifteen or twenty different seedlings we might find something of value; but I would say we have no trees or cions to sell. We have distributed the cions over the State wherever we could place them for testing, and I may say that I have nothing to make out of it at all. I have nothing to sell. I thought a splendid thing for Minnesota would be the variety known as Scott's Winter. We have been growing it for some time and, as you see, it is a nice looking apple. It does not rival the Wealthy for beauty, but I think it is a little better in quality.

Mr. Sias. Has that seedling you speak of been named?

Mr. Underwood. That seedling, no, sir. It is a good looking apple, and when we come to give it cultivation I think it will improve it. The tree looks strong and healthy, growing in the sod. I don't know what it will do under good treatment and good culture.

Mr. Sias. How long have you kept it?

Mr. Underwood. Well, last spring we kept some of them along in the middle of March; but I cannot say if a man had a thousand bushels of them growing in an orchard that it would be a good keeper. You can't tell by the samples you pick off

a tree and take care of—you cannot tell by that that it will be a good keeper. It is a tart apple and resembles the Scott's Winter. I have been struck with the similarity, still they are dissimilar. It grows on a rented place about eighteen miles from Lake City, without any care. I have tried to get some history of these seedlings. The man who originally planted them just planted some seed and set out an orchard. As it is unlike anything I know of, I take it for granted it is a seedling. Everything indicates it is a seedling orchard. I think, perhaps, it would pay everyone to try the Scott's Winter.

Mr. Sias. I have that and it is doing well. My trees are hardy.

Mr. Harris. I have just heard of another seedling of which I made a diagram and sent a man to get a specimen. The tree is said to be twenty-eight years old, and the man who has it raises and sells a good many barrels of fruit from it every year. He says it keeps all winter. I had a couple of the apples but they were not in season at the time I got them; but I should think they would keep pretty well. The man brought in two wagon loads of the apples and sold them in the town of Hokah for winter apples. It is an apple which closely resembles the Tallow, or Golden Pippin. I intend to visit the tree and if it has an outward appearance of being hardy at that age, I shall try to procure scions this spring. I will make further report on it next year.

Mr. Smith. Mr. President, I found a seedling last fall that I thought was pretty nice and I had the promise of some of the fruit for exhibition, but the gentleman has not got around. I want to tell you a little about the apple to show that we have an abundance to draw from. The party described this tree to me as a seedling growing on the open prairie, that has been fruiting for the last eight years. The tree has never killed a bit, is hardy and smooth, the bark is light colored but very firm,—no cracking, shelling or blistering; the limbs start out like those of the Hyslop crab, so there is no danger of splitting down. I might say that Mr. Harris, myself and somebody else were a committee to report on some apples that were on exhibition in which we had some thirty or more seedlings, among them the Brett seedling, and some others that we thought were very fine, but as a matter of fact on all points we were compelled to give the preference to that apple. It is an apple a little larger than this specimen I have here, yellowish white, conical in shape, flesh

white,—very much like Mr. Gideon's Excelsior; but it is of fine flavor. We will endeavor to have this seedling on exhibition another year. We will have a sample of the wood and a history of the tree as near as we can get it. On the twentieth of September the apple was still quite hard; it is evidently a late keeping apple and is of fine quality. I have tasted the Brett seedling and consider it very fine. One thing that struck me very favorably was the fact that it bore in about seven years from the seed, an evidence that it is an early bearer. I think we are on the right track for success in propagating from Minnesota fruit. I think this Brett seedling has something of the characteristics, both in the tree and the fruit, of the parent tree, it being supposed to have been from either the Talman Sweet or Golden Russet. Take the longest keeper of the Brett seedlings and you will find the skin very much like the Golden Russet, and I have no doubt it will be very much liked. I believe one of them is marked down the side the same way the Talman Sweet always is. The Brett seedling is valuable stock to propagate from.

Mr. Sias. I like Mr. Smith's remarks on seedlings, but I would like to say just a word about the Brett seedling that we had in competition with some others. Those same samples, after being carried twenty miles on a wagon to the Southern Minnesota fair and exhibited there for two weeks, were taken to the State fair, and were handled by everybody, and still they took the first premium as the best collection of seedlings. We did not intend to place them in competition with anything after that as they were too nearly used up; but I boxed them up and sent them with some other things to my friend Pearce. We sent them because we had no other samples, and not to be placed in competition with anything else. We hadn't time to get new samples. The original tree had about two bushels of fruit. The tree must be some eleven or twelve years old.

Mr. Elliot. Mr. President, I have a sample of a seedling raised by George Woolsey, of Minneapolis township, raised from seed of the Wealthy. Mr. Woolsey is away this winter and he left these specimens with Mr. Gilpatrick to be brought to this meeting. These seedlings bore fruit five years from the planting. The tree itself seems to be as hardy as the oak. They are situated where they get the heat of summer and the cold blasts of winter. The tendency to bearing early shows the same propensity as the Wealthy. What the quality is I cannot say. I merely bring

this to your attention so as to bring them before the society. I would say in regard to this matter of finding something adapted to our State I think is the point we should seek after. We have got to reach out for hardy varieties of apples for this northern climate and we have got to look to our seedlings; not only to our present seedlings but to those of future generations. It is by this process of acclimatization that we are going to derive the benefits of northern fruitage; by taking all the desirable seedlings that we can gather up from the different stations I think it is very evident that we will get the benefit. Out of the thousands and hundreds of thousands of seedlings that have been started in this State we have but very few of what we may call "iron clads," but each year is bringing new favorites to our attention and I think the time is not far distant when we shall receive accessions to the number that will give us something that will be worthy of propagation.

Mr. Tuttle. I wish to say a few words on this seedling question. I wish here to acknowledge, on the part of Wisconsin, that your work in this direction has been far ahead of ours, especially in its results. I look upon the Wealthy apple, originated in your State, as being of more value to Wisconsin, as a market apple, or for general use, than all the American apples put together. I have been growing seedlings from Wealthy and Tetofsky and have several hundreds of them. I don't know of anything that has been thoroughly tested that is reliable for us to plant for general cultivation. We have the Pewaukee and I have seen the original tree which for the past twenty years has borne good crops. I had great faith in the Pewaukee and planted it in my own orchard until the year before last winter, and I thought it was just the tree for us; the trees were perfectly sound and some of the trees bore very heavy crops. But I find that they are failing where most of our seedlings fail, even after years of trial; when they come to a hard winter, after bearing a heavy crop and exhausting the vitality of the tree, they fail; and I fear we shall find this to be so with many of them. It is well in testing these new seedlings, where they are to be disseminated, that they should have a thorough trial and for a long period.

I have been looking to the new apples from Russia to supply the necessities for fruit for apples in this Northwestern country, but I think that this work in the seedlings is a thing that should be carried on both by our State and yours; I have no doubt you

will find some seedlings that perhaps are more hardy than the Wealthy. But it is good enough for us; in fair locations it is all right. The Wealthy for its quality, for its keeping, for its early bearing and hardiness of tree,—I do not know of anything among American apples that will compare with it. We are grafting the Wealthy pretty extensively this winter. I want to say a word in regard to a seedling that has been receiving some attention with us, known as the Northwestern Greening, of Wisconsin. At the December meeting at Green Bay, the evidence was that the old tree bore two crops and died, root and branch, and still it is being propagated, and I know by some persons is considered a hardy tree. Now it will be perfectly safe at least to try it still further for awhile.

Col. Stevens. Mr. Tuttle, how is the Wolf River?

Mr. Tuttle. I see no reason why that is not a hardy apple. We have several varieties.

Mr. Pearce. Is the Wolf River seedling considered as good in quality as the Wealthy?

Mr. Tuttle. No, sir; it is more like the Alexander. In fact it is so near it that the apples which we exhibited at our winter meeting, where they were placed by the side of the Alexander, were so near alike that it was hard to tell which was which, and persons who did not know couldn't tell the difference. And Mr. Peffer, a gentleman of the committee, pronounced it the Alexander. But the apples I have seen since do not resemble the Alexander as much, but I think quite likely it is a seedling of the Alexander.

Mr. Sias. Is the Wolf River as hardy as the Wealthy?

Mr. Tuttle. Well, sir, I could not say; but I think it is.

Mr. Harris. I have no doubt that the Wolf River, if a seedling, is from the Alexander. The habit and growth of the trees on Mr. Phillips' place are so nearly alike that I couldn't tell them apart. Mr. Phillips thought he could see a difference; I could not. The tree blights just as bad as the Alexander, and that is the great fault; the Alexander is not as sound in Minnesota as the Wealthy.

Mr. Harris. Mr. President, we have established a precedent in the State Horticultural Society of electing to life membership men who have done life service in the society and accomplished as it were the work of "old warhorses," who have done work for the Northwest and distinguished services, and I rise at this time for the purpose of moving that we make one who is present a life mem-

ber of this society; I refer to Mr. A. G. Tuttle, who is one of the old pioneers of the Northwest in fruit culture; he has spent a lifetime in developing and trying to solve this great problem which so interests us here; and we could pay no greater compliment to the Wisconsin State Horticultural Society, of which he is an honored member, than to thus recognize his work. I therefore move you now that we make Mr. Tuttle a life member of this society and confer upon him every privilege which we ourselves enjoy.

The motion was unanimously adopted.

Mr. Dartt. Mr. President, in regard to these seedlings, I think there is one point in favor of the bleak, exposed places in Minnesota as places of experiment. Now we have away out on the prairies, we have in Steele County, several seedling apples recommended to have stood for many years and borne choice fruit. Now, if the members of this society can go into such unfavorable localities and get good apples there will be one point that they will have secured and that is hardiness. You may get apples along the Mississippi, you may get them in Wisconsin, find them all right in every respect, but you are not certain about their hardiness; then you have to go to work to test their hardiness and see if they will stand in exposed situations. If you send your committees into unfavorable localities and there find your apples you will have the hardiness secured beforehand. I have one apple that I have tried for several years; it was supposed to be a seedling; I refer to what we call Yearl's Winter. Mr. Yearl presented the apple to me when I came to Minnesota about fourteen or fifteen years ago. I got some cions from him and grafted some. In the nursery it did not prove to be remarkably hardy, but the trees, since they have got to bearing, with me have been just a little harder than the Wealthy. It is not hardy enough so I could recommend it. It is a good winter apple and keeps nicely. Have heard of other apples in Steele County that were highly recommended which, if you would hunt them up you would perhaps find had died, like the one the gentleman referred to. It is possible that a good many others, when you look them up, you may find the old tree dead. I understood years ago that the original Wealthy was dead, that it had died down and new sprouts had come up. I suppose that is so.

Mr. Gideon. It was blighted.

Mr. Dartt. I suppose that is known to be a characteristic of the Wealthy. Some times the main tree will kill down, and if

you save the sprouts and let them grow they will soon replace the old tree and may prove to be a good bearing tree. I was told it would do this by Mr. Gould, of Excelsior. He said to me one time, on seeing one of my trees in that condition: "There's a bunch of sprouts that will produce a wonderful sight of apples if you will let them grow and take care of them." Of course I have seen so many of such sprouts in my experience that would kill down that it is usually my plan to root them out. But I will say, further, that I have been caring for the Wealthy as far as I can and have hopes that it may pay me for my labor some time; it has not done it so far.

Mr. Underwood. Do you cultivate your orchard?

Mr. Dartt. Usually I do.

Mr. Underwood. Do you protect the body of your trees?

Mr. Dartt. I have not; but I tried it in Wisconsin. I have got too many.

Mr. Underwood. I consider Mr. Dartt as a sort of a rudder to this fanciful society of ours. We are all the while drumming up something to build up his hopes only to have them dashed to the ground, and I want to ask him now in regard to that seedling I have mentioned, which is growing about eighteen or twenty miles back from Lake Pepin, on prairie ground, as high as there is in that part of the country. It is on an exposure to the south, and is standing in the sod. The German that now lives on the place don't know very much about it. My attention was called to it, and I have been out there several times to keep watch of it. Now, I want to ask you whether you think it is a very favorable locality. I will say that the tree looks well.

Mr. Dartt. Are there any deep valleys in the vicinity?

Mr. Underwood. There are ravines all through.

Mr. Dartt. How deep are the ravines?

Mr. Underwood. Well, I think nothing but what is tillable. It is a splendid chicken country; there are ravines fifty to a hundred feet deep. I don't remember of anything of note, although we drove all through the locality, hunting chickens.

Mr. Dartt. I should not regard that as a remarkably favorable locality. I wish to be understood, however, as saying that I believe high land in the vicinity of low land is a favorable locality, decidedly so. It is better than low land itself. But when you get where it is all high land for miles around—in one broad sweep of level country, where it is all high—I think it is a trying situation. I think we have a trying situation in Steele

County generally. There are no deep ravines and no streams of water, but it is high tableland. I think all of those sections bordering on deep valleys, or on bodies of water, that are not very much elevated, are favorable localities, and that varieties produced in those localities ought to be thoroughly tested as to hardiness before they are to be recommended to those people who live out on the high lands, to plant generally. I don't know but it is a "fraud" for this society to say to people living in my locality that they can raise all these varieties that you raise, and find them profitable in my locality. I think some of our people so regard it and look at it about in that light. They think if you don't know that such varieties as you recommend won't grow, that you ought to know, for you are supposed to know everything in regard to fruit. You ought to be well informed, and ought not to send out any unreliable varieties. One man said to me that he believed that the introduction of the Wealthy was a damage to Minnesota. I don't believe that; I think it is a grand good thing. But don't try to fool us into the belief that it will grow everywhere, for it won't.

President Smith. We have only about half an hour more this morning. We have a delegate here from Wisconsin who is to make a report on Russian apples and we shall be pleased to hear from him. I will therefore call on Mr. A. G. Tuttle, of Baraboo, for a report on Russian apples.

RUSSIAN APPLES.

Mr. Tuttle. Mr. President, I am able to make only a partial report on Russian apples, although I have been at work and investigating the subject for some fifteen years past. We have some Russian varieties that we think are all right. I exhibited at our State fair this last fall sixty varieties of Russian apples and we made a very good show so far as that is concerned; many of them were very large and showy apples. I have the Longfield and I have been of the opinion that the fruits brought from that portion of Russia, off northeast of Moscow, would be perfectly adapted to the prairie regions of the Northwest; and from my experience with these fruits I have not yet lost faith that that will be the case.

I have not seen anything, among over a hundred varieties that I have in orchard,—I have not seen anything so far as the wintering is concerned, that is hardier than the Wealthy, so far

as the tests I have made. And I consider the Wealthy as hardy as anything that has originated in our State.

The country from which these Russian varieties come is very similar to this; it is a great prairie country of a thousand miles in extent,—a rich prairie country, many portions of it. There are orchards there situated in what we would consider very unfavorable localities, on deep, black soil; but they are successful, and in those orchards they have been growing fruit for hundreds of years. I thought myself, at the start, that we never should be able to find anything among the Russian apples that would keep, from the fact that the trees there were grown so much further north than here, and it is a so much colder country that the apples that were there winter apples would become fall apples here. But we have fruited some that were good keepers, some that will keep nearly to the time of the season of new apples. So that idea has been dissipated. We are going to have a fair number of late-keeping Russian apples. For summer we have an early apple and a better apple than anything else that I have ever grown for an early apple; that is, considering the quality and its appearance, for the market; I do not think we have an apple that is equal to it, as an early apple. It is longer in season than any early apple I have ever known. My apples get ripe about the twenty-fifth of July. I had some at our State fair that had been lying on a shelf in an upper room until the time of the fair and that were in good condition. This apple, so far as quality is concerned, is about like the Early Harvest; I think they are a better apple. The tree seems to be perfectly hardy and is a very early bearer; have had the tree bear when only three years old from the graft; it is a very desirable tree for an early fruit.

Then we have another early apple that is better in quality,—in fact we have nothing better so far as quality is concerned except the Early June. It would not be a good market apple because it scabs somewhat, but it is of very fine quality; the tree is very hardy.

There seems to be a peculiarity that these trees come in sort of classes. There is the Alexander class, there are several apples of that class, all subject to blight, every one; the Tetofsky, and six or seven of that class of apples have the same peculiarity. There are others more showy than the Alexander, some of them that are striped and quite large; these apples are subject quite as much to blight as the Alexander; but as the trees get older they do not show the blight so much. Then we have a class of

apples of the Anis family, and there are several varieties. How valuable they are going to be I am not prepared to give an opinion. The tree is said to be perfectly hardy, said to be the most hardy of the Russian fruits. There is quite a difference in the varieties belonging to the Anis family, as regards the quality of the fruit. We have one known as the Anisette, which is almost if not quite the Duchess; it is very similar to the Duchess; the tree looks very much like a Duchess. We have also the Red Anis and Yellow Anis; I cannot see any difference between the red and yellow. These are among the five varieties found by Mr. Budd in Russia.

We have another apple that we have tested enough so that we are willing to put confidence in it, and that is the Longfield. I don't know of any of the Russian varieties that is perhaps more valuable to plant. I have fruited it for five years in succession and raised a crop every year. I have the apple here. It is an apple of good quality, and I think fully as good as the Fameuse; and I think it is a better keeper; my apples have not rotted as much as the Fameuse. Dr. Regel says of the tree that in an orchard of over a hundred varieties it is the only apple that would bear every year. With me it has fruited, as I say, every year for five years, each year increasing its crop; and I had trees this year the most heavily laden with fruit that I have ever seen. Here is a specimen of the Longfield. Here is an apple that is a great keeper. That tree is a great bearer, and I think the fruit will keep till June. This specimen is the Longfield.

I have another apple that came to me under the name of Lord apple that is much like this one in appearance and is a little more acid, rather a sharp acid, fine grained, and a very good keeper. I think it is going to be a valuable tree for a late keeping apple. It is a good bearer. I neglected to gather the fruit on that tree until the last of October. I was told by a neighbor that he saw a person carrying fruit from my orchard, and had seen him making two or three trips. I examined and found no fruit left except a few specimens I found in the grass; these are the ones. That is a late keeper, probably as late as any I have.

I would say that these apples were on exhibition at the county and State fair. I put them in a box and they were there until two weeks ago when I went and picked them out. That is the Lord apple.

I have no question in my own mind, from what I can see and from my experiments with these Russian fruits, that they are going

to be adapted to this whole prairie region, clear up to Manitoba. Trees have been doing well with me the past five years. Some of my trees set three years ago have been fruiting some, and have come through these hard winters in perfect condition. I can see no reason why these apples, coming from a country much further north than ours, and with conditions very much like ours, should not be adapted to the climate here. There are no orchards on this continent that will compare in extent with the orchards which are to be found in Russia. The whole business of a considerable portion of this country seems to be the growing of fruit in an open prairie country, and it is a business that is successful. The Volga answers to the Mississippi and the Missouri here; it drains a great prairie country, a rich prairie country, and these apples grown on the Upper Volga are transported to Palestine and Southern Russia, and there they find their market. The people living in Palestine get their apples from Russia. Mr. Gibb tells me that they told him there that their mildest winters the thermometer ranged lower than it does here this winter. And that without a particle of snow on the ground the trees were preserved.

It will take some time yet to try and determine the value of these Russian apples. I have some fifty varieties that I have not fruited yet; I fruited some sixty last season and we expect to find something among them that will be of value; we have already found something that I know will be of value to this whole Northwestern country.

I have not come here to represent a nursery; I come here as a fruit grower. My business has been fruit-growing for more than thirty years; I try to throw aside my nursery business whenever I go into a convention to talk fruit. My orders for these trees are fifty times what I am able to supply; I don't take one order in fifty. I am not here to recommend any fruit for the purpose of sale. I have already had too much notoriety on this Russian apple business through your reports and that of Iowa, and the report of Mr. Gibb, of Canada.

Col. Stevens. Have you raised the Russian Transparent?

Mr. Tuttle. Yes, sir; it is the early apple I was speaking of. I think there is some variation in this class of apples. Take the White Transparent and the Yellow Transparent, I can see no difference in the fruit. Whatever else we may find for an early apple among the Russians, I do not expect to find anything better than that. It will be the early apple not only in the Arctic regions but here as well.

Mr. Smith. I would like to inquire about No. 190, known as the Tiesenhausen.

Mr. Tuttle. It is a late keeper; it is of good quality and in form like the Ben Davis. Prof. Budd, when he returned from Europe, gave out the idea that the apples that I had were not the true Russian apples, but were German and coast apples. Well, I happened to have pretty much all the kinds he mentioned and among the varieties I have are the five varieties of the Anis. I have taken pains to get the best, and Mr. Gibb, of Quebec, says, after looking over my orchard and examining my Russian apples in my orchard, that I have nearly every variety of value. At that time he held out the idea that my apples were not adapted to Minnesota; but I guess, perhaps, he has now given that up. I have had a little controversy with him. The fact of the matter is that Dr. Reed, in collecting those fruits for the United States, did very thorough work, and he selected apples which were grown throughout the whole of Russia.

Mr. Sias. I would inquire if you have fruited the Red Black?

Mr. Tuttle. No, sir; I have not.

Mr. Sias. I have a specimen here I would like to show you.

Mr. Tuttle. I would like to say a word about the Repka, on account of its late keeping, and which Messrs. Elwanger and Barry highly recommend. With me it is a late keeper and seems to be of very great value. My trees stand on June grass sod and have stood there for five or six years, but have borne every year; the past year they bore a very heavy crop.

I wish to say here that I would rather be the originator of the Wealthy apple than to hold the highest office in this State. It has done more for the Wisconsin Horticultural Society than anything that has ever been done.

Mr. Smith. Is it not your opinion that these seedlings show better characteristics as to shipping and keeping qualities than the average of the Russians?

Mr. Tuttle. I do not think that a promiscuous lot of seedlings would show equal keeping qualities. We have very few Russian varieties that are not better keepers than the Duchess. According to one authority the Longfield will keep as well as the Snow apple, and we call the Snow apple pretty good.

Now, I am not advertising these apples myself; in fact, many of these new kinds I haven't got in the nursery at all, that is, I have none for sale. Until Mr. Gibb came to my place there

were several kinds I didn't know anything about. There are men who are traveling through the country selling Russian apples and it is a credit to their business, but there are lots of things that are sold that are not Russian. The Pewaukee is sometimes sold as a Russian apple, and the Waldron. They come here and sell them, but I have not seen any of these men traveling and selling Russian apples that were selling a list of strictly Russian apples. They send out the Lord apple when it is nothing more than the Alexander.

Mr. Sias. I have fruited about fifty varieties of these new Russians and I fully agree with Mr. Tuttle on that point raised by Mr. Smith, as to whether they average as well as the seedlings. I think the Russian varieties average much better; that is, as to quality and hardiness as compared with the seedlings. Now, I am on the seedling committee and don't wish to say anything out of the way in regard to the seedlings, for I believe in the seedlings, but facts are what we are to get at. The Russians are hardy and they average much better than a lot of seedlings through the country, such as are generally to be found.

Mr. Tuttle. Mr. Dodge says he did not find the true Duchess in Russia. The Red Anisette, the Yellow and the Green Russian are all so near alike that one has difficulty to distinguish between them; and yet I can see a little difference. They are Duchess in tree and Duchess in fruit.

An adjournment was here taken until afternoon.

EIGHTH ANNUAL MEETING

OF THE

MINNESOTA AMBER CANE ASSOCIATION.

AFTERNOON SESSION.

SECOND DAY — WEDNESDAY, Jan. 21, 1885.

The afternoon session of Wednesday was set apart by previous arrangement for the transaction of business in connection with the Amber cane industry.

At 2 o'clock P. M. the convention was called to order by Capt. Russell Blakeley, president of the Minnesota Amber Cane Association, who stated that many of the members of the association were in New Orleans in attendance upon the World's Industrial and Cotton Centennial Exposition, now in session there, which would account for the limited attendance here this afternoon, and welcomed the large audience present to this meeting, and invited them to participate in its deliberations and discussions.

Prof. E. D. Porter, secretary of the association, stated that as the proceedings of the last meeting were all published in the daily press, he had not brought with him the records of daily meetings for last year, supposing they were completed with the close of the annual meeting. He would present to the meeting his financial report as secretary and treasurer for the past year :

Report of the Secretary and Treasurer of the Minnesota Amber Cane Association for the year ending Jan. 21, 1885:

Balance in the treasurer's hands Jan. 22, 1884.....	\$80 90
Amount received from membership fees, 1884.....	22 00
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Total	\$102 90
Cash paid for printing notices and tickets	\$7 50
" " record book.....	1 90
" " stationery and postage	2 20
	<hr/>
	11 60
	<hr/>
Balance	\$91 30

It was moved that the report be received and adopted. Carried.

Capt. Blakeley. I would suggest that the officers for the ensuing year might be elected at the present time.

Mr. Ditus Day, of Farmington. There are so very few of the members of the association present, many of them having gone South, among them Mr. Kenney and others, I therefore move that the present officers of the Amber Cane Association, including the president, vice president, secretary and treasurer, be continued for another year.

The motion was amended to include the members of the executive committee and adopted.

The officers thus elected are as follows:

President—Capt. Russell Blakeley, St. Paul.

Vice President—Ditus Day, Farmington.

Secretary and Treasurer—Prof. Edward D. Porter, Minneapolis.

Executive Committee—R. Blakeley, St. Paul; D. Day, Farmington; E. D. Porter, Minneapolis; Seth H. Kenney, Morristown; J. F. Porter, Red Wing.

Prof. Porter moved that a committee be appointed by the chair on exhibits of sugar and syrup, and Messrs. Ditus Day and Wyman Elliot were appointed as such committee. Mr. Elliot asked to be excused from serving, as his time was occupied otherwise, and Mr. R. C. Judson was appointed in place of Mr. Elliot.

Capt. Blakeley. It is with pleasure that I am able to announce the presence of the honorable ex-commissioner of agriculture of the United States, who has been identified with the amber cane

interests of the United States as well as of the State of Minnesota. I am glad to welcome him to our meeting, and should be glad to have him address the convention.

Gen. W. G. Le Duc. Mr. President, I am very much obliged to you for the very kind introduction and invitation extended to me, and I am very glad to meet with the friends here to-day. I find here many familiar faces and a great many that are new, at least to me, although perhaps not new to you. It would afford me pleasure to join heartily in your plans and take part in your deliberations. That I could give you any information on amber cane I think is extremely doubtful. Of course I have felt a lively interest in the sugar products of our country, and this is especially true with regard to the product of our own State. I have traveled to some extent in foreign countries and in places where sugar is produced, perhaps, a great deal cheaper than it can be here. It may be interesting to some of you to know how much cheaper sugar can be made in Mexico than it can be here, and that it would be idle for us to undertake to compete with the people of that country in sugar-making under similar circumstances.

I have been in Mexico where the sugar grows from a single planting and yields a crop for eighteen years, and yields a large crop of sugar, which is easily obtained. They boil the juice in open kettles and it makes a strong, well-grained sugar, valuable for refining or for any other purpose. This was in Sierras Calientes on the west shore, or on the Gulf of California. It has occurred to me that when we have ratified the treaty that is now before Congress that the people of Mexico might compete with us who raise the amber cane, and the question was suggested as to how far this would interfere or come in competition with our industry, if sugar were to be brought from that country, where it may be raised so cheaply. There are other elements that enter into the production of sugar; there is the element of population, and there, my friends, we have the advantage; there is the element of mind and body, and there we have the advantage; there is the element of transportation to market, and there of course we have the advantage; because in that country, where I have seen so excellent a growth of cane, the people are very much as they were 1,800 years ago. I cannot better illustrate the condition of that society there to you than to tell you of a conversation I had with an American who had been settled there for twenty-nine years, a gentleman who had

gone into that country to save his life. He was complaining about the "Yankee greasers" that came and settled in Mexico, because, as he said, they were the worst kind of greasers in the world. I asked him "Why do you stay here; is it to get rich?" "Not exactly that," he says. "I have had my ups and downs in the world, but" he says, "I have a hope of a hereafter." "Yes, what is it?" "Well," he says, "you know my people down here are all good Christians; we believe in the Bible and are of the Catholic kind and of course are earnest, conscientious Catholics and all believe in the second coming of Christ, and when that takes place I hope to have my compensation for living here." I asked, "Well, how do you expect to obtain that?" "Why," he says, "when Christ comes again on this earth he would very naturally come down first to the country where he lived when he was on earth before, and when he found everything there reversed and entirely changed, he would leave the land of Palestine and go to Rome; there he would see the great temples and palaces erected for the worship of God, and he would say, 'this is not my nation and people' and he would come over to New York; and when he got there and heard the bustle and rattle and the rush of the cars and saw the hurry of the people, he would naturally get out of that country as fast as possible and would pass over the country until he reached this fair land, where he would see the people carrying water on their heads, or riding on a jackass's back, or plowing with a stick, and he would raise his hands and say: 'Lo! and behold my chosen people, just as I left them 1,800 years ago!' and I hope when that ingathering comes that I may have some chance." (Laughter.)

Now, my friends, there is no better illustration of the class of people with whom we have to compete in this new territory, for we may describe them just as they were hundreds of years ago. Think of our American citizens competing with such people in raising sugar; if they could not compete with them in that or in anything else I would be ashamed of my people. But I will not detain you with any extended remarks; this is a little talk that your president has gotten out of me and that without any reflection. I am very glad to be among you in Minnesota and have an opportunity to meet with you and to be among those who have intelligent faces and who live on something besides beans. I tell you if you ever go into that country you had better take your own provisions with you if you don't want to starve to death. There

are two schools in the country; one I saw and the other I heard of. Give me a country where the people are compelled to be active both in mind and body. In that country where fruits abound you would not find any fruit upon the table, not even a melon or an orange; they do not know how to live. If the treaty is ratified we shall be compelled to compete with these people of Mexico in the making of sugar.

Prof. W. A. Henry, of the Wisconsin State University, Madison, Wis., was then introduced but excused himself for the present from making any remarks.

Capt. Blakeley then proceeded to deliver the president's annual address, as follows:

CAPT. BLAKELEY'S ANNUAL ADDRESS.

Gentlemen of the Convention:

The address of your president in years past has contained a general review of our industry within the State during the year, as reported by its members assembled in convention. Owing to the absence of many of the principal cane growers of the State I have not been able to ascertain the amount of sugar and syrup made within the State during the season. I hope this omission may be supplied during the session so that it may appear in the record of our proceedings. I am, however, able to say that the season has been more than an average good one and that our confidence is as strong as at any time in the past in the immense importance of this industry to the State. As you are aware, the convention and its sugar and syrups are very creditably represented in the great exposition at New Orleans, and our thanks are due to the persons who have contributed to this result. Prof. Porter, our worthy secretary, will address you on the situation and result of our exhibit, and I am sure that you may expect a gratifying report from him on this effort to call the attention of the general public to the result of our enterprize in developing this new source of supply of sugar and syrup for our consumption.

The present condition of the sugar interest and its future welfare I am sure is of sufficient interest to you to justify me in making rather more than passing reference to it. As you are aware, the increasing demand and supply of sugar throughout the commercial world during the last decade is without a parallel in history. The average produce of cane sugar is annually about

2,150,000 tons, excluding China and India. The amount of beet sugar made in Europe in 1884 was 2,530,000 tons, which makes a total of 4,680,000 tons. The consumption of Europe for a year ending Sept. 30, 1884, was 2,289,000 tons. Amount consumed in the United States for the year ending June 30, 1884, is estimated at 1,251,000 tons of 2,240 lbs., which being deducted from the aggregate amount produced leaves 1,140,000 tons for the consumption of all countries beside Europe and the United States.

There was on hand in Europe on Oct. 30, 1884, 552,000 tons. I have not been able to lay my hand upon an estimate of the stock on hand in the United States on June 30, 1884, but the increased importation for the year is about 250,000 tons, and the consumption *per capita* of fifty-one pounds, an increase of seven and eighty-six one hundredths pounds during the year. The average duty paid upon dutiable sugar for 1884 was one and ninety-four one-hundredths cents per pound.

I believe that the foregoing statistics are reliable. They are taken from French and British authorities in Europe and from what I regard as the best authority in this country. There is by no means an extraordinary difference between the production and consumption; yet sugar, when compared with the prices of other articles of consumption, is lower than ever before in the last one hundred years. In the London market, January 1st, beet, eighty-eight per cent purity, f. o. b., was quoted at ten shillings per hundred pounds, and Cuba centrifugal seven shillings and six pence per hundred or long hundred pounds. Fair refining on January 1st was four and five-eighths cents in New York.

Another remarkable condition of things has been developed. There have been imported into Great Britain during the year 193,270 tons of refined sugar, and while we have imported of beet grown sugar to a very large amount, we have exported to Great Britain 49,643 tons of refined sugar. Such are some of the remarkable results of legislation in this country and Europe in regard to sugar. You ask, what is the reason for this condition of things. If I may be permitted to express an opinion I should say that it was a panic. Sugar cannot be made for these ruinous prices anywhere, and while it is a very serious condition of things at present, it will soon right itself. While syrup is selling for a usual good price our people who have been engaged in making sugar have had a very disastrous season. I think it will be of short duration.

There is one other source of trouble to our industry. I refer to the Spanish-American treaty. What ever induced the president to recommend such a measure is beyond my comprehension. If I had been in favor of making a trade for free sugar, I should have asked Germany, France, Austria, and Belgium for reciprocity by exchanging pork, beef, flour, whisky, and tobacco for free sugar, to the amount of \$100,000,000; but to make the offer to take from Spain \$100,000,000 worth of sugar and tobacco grown by slaves and coolies, without a possible equivalent, is certainly a mistake. But you need not be alarmed, such a thing as that cannot pass the senate of the United States; even the free trade clubs of the country cry out against it.

The general effort that is being made to improve the processes of manufacture of sugar promises grand results. The zeal, enterprise and commendable sagacity that is now displayed, both by associations and individuals, in adopting the most scientific and approved methods of work, give us undoubted confidence in the complete success in our calling, against even the combination of capital and slave labor in Cuba, or the scientific energy and government support of beet grown sugar in Europe.

I learn that the Rio Grande Company, of New Jersey, have adopted the diffusion of their *bagasse* after it has passed the mill, and have in other ways changed their policy of former years. The *bagasse*, after leaving the mill, is carried up to the floor above the diffusion room and runs through a cutting machine and dropped into a bucket or carrier which is run from its place over the diffusers and emptied into the diffusers when it is necessary to refill them. The diffusers are ten in number, seven feet high, forty inches in diameter at the top and thirty inches at the bottom. The water that is used in this process is heated to above two hundred and twelve degrees Fahrenheit. One of the diffusers can be emptied and filled in about five minutes, and to pass the water through the whole number of diffusers in the battery takes from fifty minutes to an hour. This battery of diffusers works the *bagasse* cut into chips as it runs from the mill, of about two hundred tons of cane *per diem*.

This cane is brought from the field by a railroad operated by mules, and carries the cane as cut in the field, seed and all, and it is unloaded by portable derricks. When the cane is placed upon the cars there is a string placed around each bunch, which may contain five hundred pounds each, and the hook of the derrick is placed in this string and the cane delivered at such place

as it is needed for the mill carrier. The cane when raised by the derrick is swung under a knife, which cuts off the seed head of the bunch, which is deposited in a convenient receptacle, to be loaded on the cars as they return to the field, and is carried to a convenient point to their pig pens, where it is stacked for feeding the hogs, of which they keep about five hundred. The *bagasse* from the diffusors is also carried to the pens and worked into manure of the very best quality for their cane fields during the winter. This manner of disposing of their seeds and *bagasse* enables the company to make both pork for the market with their seed and an abundance of manure for their fields, which produce the finest quality of cane.

Mr. Hughes sent me a polite invitation to visit them during the working season, but I was unfortunately unable to do so. I have not been able to learn the result of their season's work, but will guarantee that their report will be a gratification to all. I will not allude to what is being done in Louisiana, as I expect to hear from Prof. Porter fully on that locality, and possibly more definitely from Rio Grande from some one in the convention. In conclusion I still say that the amber cane sugar and syrup industry will overcome all adverse and opposing influences in Minnesota in spite of Prof. Wiley's isothermal line and the unfriendly legislation of the government.

THE AMBER CANE INDUSTRY AT NEW ORLEANS.

BY PROF. E. D. PORTER.

Prof. Porter was then called upon to report on the New Orleans exhibit. He said:

Mr. President and Gentlemen of the Association:

My report will be very brief. I presume you are all interested to know what kind of a show Minnesota is making among the sugar makers of our country. Before making a report upon the exhibit there I want to say a few words, by way of preface or explanation, concerning the very disastrous years of 1882 and 1883, which were very discouraging to Minnesota amber cane growers and to the industry generally throughout the Northwest; and that will account, of course, in part for the diminished attendance and membership at the present meeting. Last year, 1883, scarcely a stalk of cane was matured in Minnesota. The very backward

season in the spring, together with an early fall, shortened the time for maturing the crop. We found we had very little cane that was matured in the State; there was very little good syrup manufactured and no sugar made from it that I am aware of. From these causes there was the past year a diminished area planted, largely attributable to the uncertainty of the crop the previous year. This will account in part for any diminution which may be apparent in the industry. The past year has been a very good one, not only for this State but for the entire Northwest. I have seen specimens of cane that matured in the northern part of Dakota and along the line of the Northern Pacific Railroad.

At our University Experimental Farm I had forty-two varieties of sorghum, about every variety that I could find growing in this country or in Europe. And I want to say this, that there was nothing among the different varieties that would surpass the amber cane; I found nothing that was superior to it for growth and maturity, or that was equal to it in saccharine development. If we had two or three weeks more of growing season there are two or three varieties that would perhaps give a larger quantity to the acre; but out of the forty-two varieties there was not one that would compare with the early amber of our State.

I conducted a series of experiments with these different varieties for the purpose of determining the earliest period at which the crop could be cut profitably for manufacture. I commenced the examination for sugar with the polariscope, and by the "gravity method" as soon as the seed head appeared, and continued them from day to day until growth was stopped by frost. The result of these tests only served to corroborate those of previous seasons, both in this State and elsewhere, and proved conclusively that the development of sugar in all varieties of sorghum keeps pace with the development of the seed,—commencing when the seed first appears, and reaching its maximum when fully matured,—and that the cane can be profitably cut and worked for syrup as soon as it is in the "milk," but for *sugar* should not be cut until the seed has hardened or matured.

I intended to have had specimens of these forty-two varieties here but my absence at New Orleans has prevented.

Now, in regard to what we have done at New Orleans. We have on exhibition there about one ton of sugar and ten barrels of syrup from Minnesota, of which the specimens on the table here are fair samples. The most of this sugar was manufactured by Mr. J. F. Porter, of Red Wing. You will remember that he

commenced about five years ago at Red Wing, without any previous experience; he was a tanner by profession, but taking a deep interest in this new industry he went to work, and the result of a single season was about 1,500 pounds of sugar, made with the use of the crudest home implements and machinery. We have here three specimens differing in color, and, as I said, we have about a ton of sugar like these specimens on exhibition, with about ten barrels of syrup. The syrup was manufactured chiefly by Mr. Kenney, of Morristown, and both the sugar and the syrup are attracting an immense amount of attention there. Almost at any time you may find an interested group of sugar planters of Louisiana or Texas, and people from all portions of the South, around that exhibit. I was very much amused at one group shortly after the exhibit was first up. There were in the number some four or five gentlemen and all of them I found afterwards to be sugar planters of Lower Louisiana; they were making remarks. One of them went by our exhibit, which we had just got in place. We had an open pan by a table and syrup for testing, and he touched his finger to it and tasted it; he looked at the sugar and read "Minnesota." He took some of it between his fingers and rubbed it between them and tasted it, and looked astonished. He called to a party that was passing by and said, "Come here, judge!" He asked what was the matter. He came up and the other said: "I'll be d—d if these Minnesota fellows haven't scooped us!" (Laughter.) One of them came up to the attendant in charge and began to ask questions, such as: "What does it cost to make it?" etc. The other interrupted and said, "That has nothing to do with it; *they have got the sugar.*" They looked at the mottoes and examined the exhibit very carefully. The barrels are made of black walnut and are finished off in a neat and attractive manner.

On one side of the exhibit appears the following: "Minnesota Amber Cane, Matures its Crop in Ninety Days." On the other side, "Minnesota Makes Her Own Sugars and Syrups." On another side, "Minnesota Don't Fear the Sugar Line." On another face is this: "We Are With You, Major Burke, on the Sugar Question." Of course the sugar planters coming there, do not leave until they have read the four signs, and ask questions as to where it is raised, what is the cost, and so on. They have been greatly surprised at the idea of sugar being successfully grown nearly 1,200 miles beyond what has been supposed to be the sugar belt, and sugar of the fine quality which is made

from the early amber. The planters send for jugs and decanters to be filled with specimens of the syrup and there is not a single person who has seen it but has pronounced our syrup superior for table purposes to any syrup they have in the South. There is no comparison between it and their best specimens as taken from their plantations. We have on exhibition the finest specimens of syrup from any State of the Union, made from Amber Cane. The Sterling Sugar Works have on exhibition some very fine specimens of sugar; they are lighter colored than ours because they have been bleached. They are whiter but not as good grain as ours. Their raw sugar is inferior to ours. They have not exhibited their goods in so attractive a manner as Minnesota has done and it seems to be generally conceded by common consent that she has "taken the cake." And this assertion is borne out by the fact that after the most searching analysis, and the strongest competition, Minnesota received the highest awards for the best "raw" sugar, the best "full" syrup, and the best barrels of any grade.

I had photographs taken of our exhibits but could not get the negatives printed in time to bring them with me. We will soon have photographs here of the exhibits in this as well as in all the other departments.

While there I received an invitation to visit some of the sugar plantations on the Lower Mississippi River. I accepted the invitation and spent two days on a trip which was of much interest and I picked up a good many items of value. The best plantation was that of Gov. Warmouth, which is located below New Orleans. We went to Gen. Diamond's; that is the largest one. The whole establishment is old and is in about the condition one might expect it to be after forty years' wear and tear. At Gov. Warmouth's plantation the machinery is all new and he has kept fully abreast with the times; he is turning out the very finest quality of goods.

I visited five different plantations and examined them very critically. I have specimens here of the sugar produced on the governor's plantation. This is a specimen of sugar from one of the refineries they have established in connection with their works. It is a specimen of Louisiana sugar refined. Here is a specimen as it came from the centrifugal; it is raw sugar without refining. I have specimens of second and third quality of sugar. This specimen of sugar I could have bought at four cents and a half a pound on the plantation; this sugar, at two and a half

cents; and that sugar, at two cents a pound; so you may know how much money there is in the manufacture of sugar in Louisiana.

At Gen. Diamond's they work up 1,300 acres of cane, and he told me the result of the work for three years, which will afford an idea of the profits of the business. That three years ago they cleared \$57,000 from that plantation, over and above all of the expenses. Last year they lost about \$7,000, and this year they are going to just about meet the expenses on the plantation. Large numbers of the plantations are bankrupt, or largely in debt, many of them having been bankrupt for three years past, and the sugar industry is entirely prostrated in Louisiana. If the Spanish treaty is passed by Congress the industry will be totally destroyed.

In regard to the amber cane industry and the reason why they feel down there that we have "scooped" them, is this: In the first place we have millions of acres of sugar land in Minnesota. In Louisiana, as you leave New Orleans and go down the river, towards the gulf, you can see from the deck of the steamboat about all the fine sugar land they have. All their famous old sugar plantations are in sight from the deck of the steamer, and the lands generally extend not more than a mile and a half from the edge of the stream, either to the right or to the left. As you are well aware the Mississippi River is elevated from four to seven and in some places ten feet above the general surface of the land. The country recedes on either side, and there are levees, or embankments, on both sides of the river, to guard against the danger of the overflowing of the water of the Mississippi. The drainage is all to the rear of the plantations. They have cleared the land just as far as possible; but if you want to drain and tile it, it is the heaviest, muckiest and worst kind of land for a person to attempt to cultivate that you ever saw. These are the sugar lands of Louisiana. Then, again, not only is it bad land to work, but there is a constant dread of an overflow. The overflow of last season destroyed all the plantations along the west bank of the river, with the exception of Governor Warmouth's and one or two others, for a distance of over twenty miles south of New Orleans towards the gulf. It was the overflow of last June, which was the tail end of the overflow in the Upper Mississippi in May. A crevasse which occurred at that time overflowed a large portion of the country and destroyed all the plantations, with the exceptions mentioned. With most of them

this last year's crop was entirely destroyed; the cane was entirely ruined, and the water has to be drained off and the cane replanted before they are again productive.

There is one great advantage that we possess in the amber cane industry; we have got millions of acres of land capable of producing the very finest crops of amber cane. I have seen just as many tons produced of amber cane per acre from one planting as I find on the Louisiana plantations with their three varieties of cane. I may describe the three varieties which they have down there. One is called the Louisiana cane, which is a large, heavy and short-jointed variety. Another is the "creole," long-jointed and white. The other is the red cane. They cultivate all three varieties on most of the plantations. The cane never seeds in that climate, but keeps on growing until checked by the frosts. The cane grows on an average to a height of about eight feet. In cutting it they trim off the tops and reject the worthless part.

Now, on a farm of 1,200 acres they will have only about 400 acres of cane to work up; practically one-fourth of their land is laying out, or one-fourth is old cane and the other is young. They lay out of the use of their capital about three years. They have got to cultivate three years before they get their crop. We get our crop in from ninety days to four months from planting. There the only valuable part of the cane is what they can use to make sugar and syrup. They make no use whatever of the blades. There is no seed, and their *bagasse* is a waste product on most of the plantations. In Minnesota we can make the blades worth enough to pay for harvesting the cane, and the crop of seed will pay for the entire expense of cultivation, and it leaves us our sugar and syrup as a clear profit. This is an advantage which I think will enable us at any time to compete with the people of Louisiana in the production of sugar and syrup.

Capt. Blakeley. Or anybody else.

Prof. Porter. Or anybody else.

Gen. Le Duc. Are they not introducing sorghum in that country?

Prof. Porter. They say that it costs them too much. If they would go onto the back or high lands and introduce sorghum they could do it, and I understand they are doing that to some extent. The sorghum is coming into use to supply the home demand.

Now, I wish to say in regard to values, I had offered to me there the very best quality of New Orleans molasses at twenty-five cents; the second quality for eleven cents; the third quality for seven cents a gallon. The price of sugar was quoted to me at two, two and one-half and four cents a pound. Now then, I don't know as there has been a gallon of syrup produced from the crop of amber cane raised in Minnesota during the past year which has sold for less than fifty cents a gallon. There is enough demand for the entire product here in Minnesota, so that we need not trouble ourselves about an over-production until we have met the demand for syrup. Taking all these things into consideration, I do not think that we have met with sufficient drawbacks as yet to discourage us in the growth of amber cane; but there is everything to encourage us. In Louisiana they calculate that they will get only one paying crop out of three or four.

There were two or three processes that I found in use at Gov. Warmouth's which are not in general use upon other plantations. The cane, instead of being put through the crusher in the ordinary way, is torn to pieces by a shredder. The cane is stripped and it is put into this machine and torn to pieces and then passes through the rolls; and they claim that by this process they make a gain of about twelve per cent in the extraction of the juice. I was talking there with their chemist and he informed me that they had raised the product of the juice from sixty-eight to eighty per cent. Gov. Warmouth has introduced the most recent and improved machinery to be had, and one of his improvements is the use of a *bagasse* burner; by the use of that the cane passes on to a separator which conveys it along until it drops in front of the burner. It is not handled from the time the cane is put in; the men do not touch it from the time it is laid onto the mule cart out in the cane field. He has laid a tramway from the mill out to his cane field, so that one mule can haul seven cars and does the work of twenty-eight mules or horses in the ordinary way; and from the time that the cane is taken up and laid on the car the men do not touch it again until it reaches the mill; it all goes by machinery, and the cane goes off into smoke one way and the juice into syrup and sugar the other, and in that way, by the application of labor-saving machinery and the most improved machinery that he can get, Gov. Warmouth is overcoming the discouragements and drawbacks that other planters have been contending with upon their plan-

tations. His profits this year upon his plantation he estimates will be about \$50,000.

Capt. Blakeley. How much do they value their cane per ton?

Prof. Porter. I did not ask.

Capt. Blakeley. I saw a report somewhere that they were getting about one hundred and eighty odd pounds of sugar from a ton of the cane; that is a good deal more than we could do with the amber cane.

Prof. Porter. The quality of the sugar may be seen by examining these samples. On Mr. Diamond's plantation I found that he was not making this quality of sugar; he was getting a lower grade.

Gen. Le Duc. He uses open kettles and open pans?

Prof. Porter. Yes, as well as a vacuum pan.

Gen. Le Duc. Did they use the corn stalks anywhere where you were?

Prof. Porter. No, sir; it was not used, and I did not find a single hill of corn on one of these five plantations that I visited. Every pound of meat, and every loaf of bread, and every particle of grain that they feed their stock was imported, and all they have to support this system of agriculture is their sugar and molasses. Of course, in the nature of things, an industry of that kind cannot stand very long.

Capt. Blakeley. Could you give us an estimate of the quantity of seed that may be produced from an acre of land, from any of your experiments?

Prof. Porter. The average product is about twenty-five bushels to the acre.

Gen. Le Duc. How do you feed it?

Prof. Porter. I have used it with advantage as feed for hogs, mixed with the hot skimmings,—or ground and fed as cornmeal. In the East I have grown it in large quantities, both for feed and for seed. The plan I have found the most economical and expeditious for saving seed is the following: Take into the field three "*horses*" about the size and shape of a common saw-horse, upon which the cut cane is to be placed. Let one man, provided with a straight-bladed corn knife, or a cane *machete*, pass between the rows, and with a quick downward stroke with the back of the knife strip the blades from the stalks; then let another hand follow and cut the canes from the hills and throw them on the horses, the heads all one way; then let a third man, with one

stroke of the cane knife, cut the heads at about the first joint, and tie the bundle with two bands. Move the horses as the cutting advances. The seed heads will thus be left in small piles, and after the cutting is done gather up the blades which are scattered over the ground, scatter them in convenient patches and spread the tufts of cane seed on them; they will cure in this way without moulding. When dry, run through a threshing machine and clean up like ordinary small grain.

Prof. Henry. Have you ever attempted to bulk your seed in a bin?

Prof. Porter. I have; I have had no difficulty in keeping it. There is one objection to threshing by machinery, the grain is liable to be cracked and thus injured for seed.

The committee appointed by the chair to examine the specimens of sugar and syrup on exhibition, here presented the following:

Your committee appointed to examine the various samples of amber cane sugar and syrup on the tables of the association, respectfully report that we find all the exhibits of a superior quality, and, as compared with those presented a few years ago, mark a most gratifying progress in this industry.

In the class of defecated or limed and sulphured syrups, we find that made by Mr. J. F. Porter, of Red Wing, Minn., entitled to the first place, and that exhibited by Hon. Seth H. Kenney, of Morristown, Minn., to the second.

In the class of raw, or unlimed syrups, we find that of K. H. Whipple, of Minnetonka, Minn., first, and that of W. G. Ford, Newport, Minn., second.

The samples of sugar exhibited by Mr. J. F. Porter, of Red Wing, Minn., are in every respect equal to those on exhibition from the sugar plantations of Louisiana.

[Signed]

DITUS DAY,	} Committee.
R. C. JUDSON,	
W. G. LE DUC.	

Capt. Blakeley. We would like to hear from Prof. Henry, and get a history of things at Madison.

Prof. Henry. Mr. President, we in Wisconsin, of course, owe our sorghum cane industry, or more fitly termed "amber cane" industry, to the people of this State, and to our former commissioner of agriculture.

Now, we have been ever grateful for that, and we have always looked up in this direction for help and consolation, for we have needed it sometimes. We started some experiments on the experimental farm. We have had a vacuum pan and an experimental sugar house, and for two seasons we have made syrup and sugar. The second year we attempted to make sugar economically, in a small way; that is, we wanted to see what we could make sugar for, and we have kept an account of all our expenses. In doing that, we found, not charging anything for our outfit, simply counting the prices we paid for fuel, for growing and getting the sugar ready for market, but not barreled, it cost us four and one-half cents a pound. The sugar would not be worth hardly that to-day, but at that time there would be a fair profit left. At that time I was careful to gather up the statistics of our State in regard to the manufacture of syrup; for while some have talked about sugar, I thought I would rather talk about syrup; we must get our bread and butter to-day from our syrups. I found that we were manufacturing about 600,000 gallons of syrup, in that neighborhood. I sent circulars all over the State and gathered up the information. In 1882 there were about 700,000 gallons produced in the State. Last year there was nearly an entire failure.

It may be asked what we have done this past year in Wisconsin. The failure of the preceding year of course put us back somewhat; yet we started in and have done magnificently both for the amount and the quality of the article manufactured.

I was at Mr. Powell's, at River Falls, last Saturday and he told me that they had manufactured 11,000 gallons. I sampled the syrup at the farmer's houses and it was simply number one. I cannot imagine how it could be superior unless it was run through bone charcoal to clarify it. The color was not as fine as some of your samples, but the flavor was number one.

We have one company manufacturing more than that. Williams & Flynn bought up a lot of land along the Wisconsin River, a very poor quality of land, which was considered as absolutely worthless and which cost them about twenty-five cents to a dollar and a quarter an acre, and which had reverted for taxes. They put up large cane works and they planted on the fresh sod, but the frost took them the first year. This year they continued their efforts and they have made 17,000 gallons of syrup. Next year I am confident they will largely increase that amount.

Now you can see why we can afford to help them in the begin-

ning and to foster this industry. The State can well afford to give it encouragement.

Williams & Flynn have one of these frame bins that we have heard of, which is a very simple affair, in which they keep the seed. I find now that our Wisconsin farmers and others who are engaged in this industry are giving up the stripping of the cane.

Gen. Le Duc. Is the reason that it does not pay?

Prof. Henry. The point is to work for economy in the cultivation, in the handling and in the saving of the product. There is where Germany succeeds in the sugar industry. We can grow fodder so cheaply that we cannot afford to spend the time to handle the blades or to strip the cane. Messrs. Powell and Williams & Flynn told me that they could not afford to have their cane stripped. The defecation with the lime is a little different. This is a point worth remembering in order to see if there is not a way to economize in this particular.

Upon this matter of saving the seed heads I would say, that we found at Madison that our crop of seed was especially good in 1881, and there was one piece that yielded as high as thirty-two bushels of seed to the acre of Minnesota early amber, and the seed weighed fifty pounds to the bushel.

Mr. Whipple. How was the cane grown?

Prof. Henry. In hills three feet eight inches one way and four feet the other; with about seven stalks in the hill. It was grown for sugar, not for syrup. But let me tell you that there is a great difference in the seed, or the amount of seed in the heads that is grown; cane heads fill with more variation than wheat heads. That year we had a very heavy seed crop and our cane that yielded over thirty-two bushels to the acre yielded a thousand pounds of sugar; that is we extracted that much. One hundred gallons of syrup, nine hundred and ninety-eight pounds of sugar and thirty-three bushels of seed were the products of an acre, in round numbers, and that was replanted cane at that. It was a very successful little crop.

Now, I have said that I would not attempt to strip my cane if I could succeed without. The second point is, do not waste the seed. Now, how shall we save it? Save it just as economically as you can. Feed it to your fattening hogs. A good way is to begin early to feed your cane seed; you will be surprised to see how it will help you out. We can keep hogs alive indefinitely on the seed, and by mixing the "skims" they will thrive almost

as well as with the use of Indian corn; but in our experiments in feeding cane seed with Indian corn I have been disappointed in the results. While analysis shows them to be nearly equal in nutritious equivalents, I was able to obtain only about fifty per cent of feeding value from sorghum seed, as compared with Indian corn, pound for pound.

Prof. Porter. Was it bolted or unbolted?

Prof. Henry. It was just ground in a common feedmill and fed with the hulls.

My work is to mingle with the farmers of Wisconsin and do them what service I can. I have been out this cold weather from farm to farm, meeting with the granges or the farmers' clubs. I find that we are the most wasteful people on earth. It is a national disgrace that our farmers will persist in wasting their products the way they do. I find people nearly starving to death in a country where we may get as good prices nearly as you can get anywhere. We should utilize the skimmings; use them as a fertilizer, if for nothing else; I use them to feed to the pigs. But in using them I would not let them get too sour. I would not feed them exclusively; recollect that. Don't try to feed the skimmings and nothing else, but mix them with their food. Williams & Flynn had no hogs. One of the firm came up with me on the train; was coming up to sell some carloads of syrup and we were talking about it. I said to him that was perfectly extravagant; he replied that he knew it and they would never do it again.

I am confident that we are going right ahead with this industry in our State. I should say that the amount of syrup produced in Wisconsin the past year has not been less than 750,000 gallons, which is worth fifty cents per gallon. The credit of this belongs to your good people of Minnesota, and we of Wisconsin are willing to give you the honor for it.

Gen. Le Duc. I would like to inquire about the defecation; how was it changed where the leaves were put through, if you will be kind enough to give us the process?

Prof. Henry. I could not in detail only to give you this: One man used coal-black, which went into the syrup. He was asked what was the difference. He said it took a little more lime. There is nothing else used yet but the lime.

Capt. Blakeley. Will the professor tell us about Mr. Powell's vinegar works?

Prof. Henry. Mr. Powell has immense tanks provided where

he keeps the material from which he makes vinegar. Into these tanks he puts the skimmings and lets them stand there. I was in his syrup house and I found his tank and its contents standing without any protection; he says he has let it stand out one or two winters and says he has no trouble in making good vinegar the next season. I believe he says it freezes very considerably; and yet it makes very good vinegar.

Capt. Blakeley. I have a barrel of it myself and prefer it to anything else.

Prof. Porter. I have found this utilization of a waste product, one of the most profitable branches of the amber cane industry, and in the line of the economy, so strongly urged by Prof. Henry, my practice has been to feed the skimmings from the "raw" end of the pan to my hogs, and to save the skimmings from the "finishing" pan until enough had accumulated to make a good "run," when I diluted them with about six parts of water and boiled down a second time. I thus obtained a good but dark colored syrup which would keep for any length of time, and constituted my vinegar "stock;" this, mixed with ten parts of rainwater, and fermented in the usual way, will furnish a vinegar of the greatest strength, purity and flavor. It takes about one year to make a prime article of vinegar by the natural process, but it is easily and cheaply done and gives a product which commands the highest price in the market.

I wish to suggest a word of warning in feeding the skimmings to the hogs: they must not be allowed to become too sour. I had a little experience of that kind once which I will relate. I had given instructions to my men to feed skimmings regularly to the hogs and not to let them stand too long; they let them stand forty-eight hours and then fed them. The result was what might have been expected; you never saw a more drunken set of animals! Three of them were dead drunk, so much so that they never recovered, but the rest of them came to. It was simply because the alcoholic fermentation had set in, and feeding it then had simply made the hogs beastly drunk.

Mr. Ditus Day, of Farmington. I would say that I have had very good success this year in making syrup,—probably the best I have ever made. In regard to feeding the skimmings I have had a little experience; it was two years ago. I trusted a hired man to feed the hogs and when I came home one Sunday, (I had cautioned him not to feed too much,) I found two of the hogs—I had six of them—were so drunk that they couldn't move. One

of them never recovered, but the rest survived. I find that one needs to be very careful about feeding sorghum that is fermented too much, but when fed properly I find that the hogs fatten well.

Mr. Kenney, of our county, made 12,000 gallons or more this year. I met him the fore part of last month and he told me that he was going to Louisiana. There is a specimen of his syrup here. I have not brought a specimen of my syrup; I tried to draw some but couldn't make it run, and I was in such a hurry I didn't bring it.

Mr. C. L. Smith. I came up from Faribault with Mr. Kenney a short time since and he told me that his product this year was 12,000 gallons. He stated that he had sold 7,000 gallons at an average price of fifty-five cents per gallon, net. He made another statement that I did not exactly understand at the time, but Prof. Porter's remarks about sugar-making in Louisiana explain his statements about New Orleans syrups selling for seven, eleven and twenty-five cents per gallon. Mr. Kenney finds a ready sale for his syrup and he asks for it about what the merchants can readily get for it. He said that he found that the merchants generally didn't like to put his syrup on sale, and of this 7,000 gallons over 6,000 gallons was sold at retail. He stated that where persons had used it they were generally ready to buy more. The retailers do not like to pay fifty-five cents for what they would sell for sixty-five cents; they could make a better profit on the seven, eleven and twenty-five; but he says that year by year the retail demand for his syrup has steadily increased; he has sold more five and ten gallon lots than he ever sold before. They would come with a jug to have it filled and say to him, "We bought a little of you last year and we liked it first-rate; this year we tried some made somewhere else and they gave us some that was sour; if you have some like that last you may send us ten gallons." About the first of January he had sold about 6,000 gallons and he thought it altogether likely by the first of May he would be able to dispose of the balance of his crop. Now, his profits on his crop, not counting the interest on his plant, the machinery on his farm, etc., but the profit over and above the cash expenditures for labor to produce this 12,000 gallons, will be close to \$3,500; he finds it very profitable. I knew Mr. Kenney years ago when he was a poor man and before he got to making amber cane syrup. Now he is head and shoulders above his neighbors, and has made his money out of amber

cane. He has made money every year; 1883 was not as profitable as some years, but still he made a profit that year. His crop of last year I presume is the most profitable he has ever grown, and I may say that he is very enthusiastic.

Now, it seems to me, here is one great disadvantage that the amber cane industry is laboring under. Here is where this association needs to put in some work. Too many men are growing amber cane and manufacturing it into a very inferior grade of syrup. People who buy that low grade of syrup become prejudiced, from the fact that they only know of it in this crude, green, raw state. Now, then, if you can educate every man that is making amber cane syrup to make such syrup as Mr. Kenney and these other men here are making, then the increased demand for it will more than equal any quantity that you can produce. That is my judgment and that is Mr. Kenney's.

Prof. Henry. The gentleman's last thought I would like to enlarge upon for one moment. In our State we published the results of our work in pamphlet form, and published 5,000 copies. The second year we published 6,000. Farmers wrote for those reports; we sent them into your State to a slight extent. I had one letter from the rear admiral of the British navy at the Sandwich Islands, asking for a copy. We printed directions for defecating. We had a great deal of fighting to do. One man says: "I don't intend to adulterate my syrup by putting lime into it." One may ask what per cent of those making syrup were defecating. In 1881 not more than one per cent used lime. In 1882 the number increased. I think now that seventy-five per cent of the smaller manufacturers have begun the use of lime. Now, it seems to me that if your society is going to get out a report, that some simple directions that Prof. Porter or Mr. Kenney could give, which could be placed in your report, would be of great value. If you could assist the smaller manufacturers you should do so, and the main point to be secured is to drive out the poorer quality of goods, and if you make a move in that direction your society can do a world of good in the immediate future.

Mr. Smith. Have you ever made any experiments by saturating your lime with sulphuric acid?

Prof. Henry. No, sir; I have not.

Mr. Smith. Have you, Prof. Porter?

Prof. Porter. I have not. It promises good results. I don't see anything against it. It bleaches the syrup.

Prof. Henry. Our farmers are inquiring about the use of the bisulphate of lime, and will attempt, I think, the use of it.

Mr. Whipple. I would like to ask Prof. Henry one question; how much, in your opinion, does it improve the quality of the syrup for home consumption to use lime for defecation?

Prof. Henry. Well, I would say that it is this way: It is a question of taste. There are people that like that strong sorghum taste. When it is grown on ordinary land it is quite strong, but not so marked on sandy land. Some people like it, but as a general thing the market does not demand it. As a rule people like to have some acid left in the syrup for baking purposes. I should say that it injured it about fifty per cent.

Mr. Smith. I think the difference is about twenty-five per cent. That is, where the lime is used it makes that difference. That is, I think there is about that difference in the process used by Mr. Whipple and that of Mr. Kenney. I think it will make fully twenty-five per cent difference in the value.

A Delegate. I think if you do not know how to use the lime you had better let it alone. I know in Farmington that you cannot sell a barrel of syrup that has been defecated. But the syrup that Mr. Day makes, the crude syrup, will sell; everybody wants it. I say if you don't know how to use the lime you had better let it alone. It spoils it for cooking purposes.

Mr. Whipple. I believe that the most that has been said on the question is in regard to the commercial value and in regard to manufacturing on a large scale. One man remarked that the small growers did not dare to come here. Now, I am one of the small growers and I dare to come; and I believe yet that I am on the right track for a small grower. When you can convince me that I am wrong I will change. Now, it has been stated that the market demands a clarified syrup. I don't know but Minneapolis is an exception; I know that it is in a great many respects, but I think not in this, for I am told that it is the crude syrup they want. They can sell it to the bakeries and to the refinery men, and for family use; for table use they cannot sell anything but the crude syrup. It may make some difference in the quality of the syrup, but I claim that there is not twenty-five per cent, nor twenty per cent, difference in the sale of the two kinds. It is on the table here and I will leave it to anyone in the house, after he tastes it, to decide on his own judgment. In regard to raising and manufacturing I have a little different way from those that manufacture on a large scale. I

use everything that grows excepting the blades; I don't use them only to fertilize my land. I make use of the seed. In the first place I go in before I cut my cane and select my seed for the next year's planting. I tie it up in small bunches and keep it away from the rain, let it completely cure and take it off with a currycomb. Very many of our small farmers don't have a currycomb, and if they do perhaps they don't use it. When the seed heads are well cured I strike them across the top of an open barrel and thus thresh out and secure the ripest and best grains for seed. The other seed I cure in the field. Once in a while there is a season that it will mould, but generally it will cure. My process of gathering the crop is about as Prof. Porter has described; after cutting the seed I leave it in a pile until I get through caring for the cane; by that time it is cured. This year I have hauled some three or four acres of it and piled it up by the hog pen, just as I have cut it in the field, and the snow has covered it up, and we are feeding it every day to the hogs. It is a simple way of caring for it, but I find that it pays to feed it. A simple way to care for the seed is when you go into the field take your knife and with one blow you sever the seed, and it can be piled up in a bin after it is thoroughly cured; and I will guarantee that I can take a thousand bushels and have it keep as well as corn. I feed it to my hens in that form; probably it requires a little labor for the hens, but they have nothing else to do. I throw it in a heap by the hog pen and it keeps there. That is the way I put it under cover. If it is cured it keeps all right, but that which I have by the pen is not under cover. I think I can keep it as well as corn.

Gen. Le Due. Suppose you put it in a corn crib, will it keep?

Mr. Whipple. Where I have mine there are some windows out and it was piled up in a heap there and here is some of the seed that I took out of the pile to bring here.

Prof. Henry. You put it in when it is dry?

Mr. Whipple. I get it dry and then it will keep. And then my *bagasse* from the mill, instead of burning that, I have plenty of waste wood in the woods there and that is cheaper for me to burn than the *bagasse*. I am also in the garden business and I would rather put it into the raspberry bushes to mulch the vines than to burn it. I am trying to make an estimate of the amount of berries from the same amount of ground with its use and without. I find there is a great difference. I find that there is a great difference in the yield of fruit and a better result secured

from that than from anything else I have tried. I have tried marsh hay for mulching, and corn stalks, but there is nothing that will keep the ground so moist as the *bagasse*. It packs down close to the ground.

Prof. Porter. While visiting one of the plantations below New Orleans and listening to the doleful complaints they make concerning the business, I saw some things that were worthy of note; and while this discussion has been going on I could not help thinking of a scene presented to me there. I saw them taking the *bagasse* by the load up to the levee and dumping it into the river. Right opposite to that they were loading up with Pittsburgh coal with which to evaporate the juice. There was cause and effect. They were using open pans and conducting the business in a most wasteful manner. All the profits going down the Mississippi River.

Mr. Whipple. I would like to state as to the manner that I care for my crop. I have a Climax, two-horse mill which I got in Wisconsin and a self-evaporator. I manufactured in twenty-six and a half days within a few gallons of 2,000, employing three men and two horses, which was all the help I had. I lacked only ten or twelve gallons of 2,000.

Mr. Ditus Day. I manufacture both ways. I defecate, and for cooking purposes I make the crude syrup. For baking, the acid in the molasses will have the effect of baking powder and it will make light biscuit. For table use and for general purposes they generally prefer the defecated article. In the market it will bring ten or fifteen cents more a gallon for the defecated; but there are others that prefer the pure juice. Last year I manufactured only 2,230 gallons, but four years ago I manufactured a little over 4,000.

Gen. Le Duc. What does it cost a gallon to make it?

Mr. Day. I cannot tell you exactly.

Capt. Blakeley. It is known to some of you that I have been conducting some experiments and have been trying to make some sugar in this State. In conducting those experiments we have been using in making sugar a process for thorough defecation. The syrup made at the refinery is not sold to the bakeries. They say it is the best syrup they ever saw but they do not want it. It has not got the acid in it. Acid is a necessity for us in our syrups, but we soon learned one thing that the syrups that were used in the refineries were not desirable for the bakers. That is information that the merchants all give. But they will

say it is the best syrup that ever came to the State,—that sugar-house syrup,—but I cannot get a sugar-house price for it. Then the question comes up, how much money can I make in the use of that syrup and how much can I make if I follow the process of some of my neighbors? When they came to compare the two they found that the cheaper syrups on the whole made the most money. It was found that the syrups that had gone through the coal filtration and that were finished in the pan, brought about the same price as the common syrups made without defecation: in fact, those that were not defecated were preferred by bakers to the syrups that we made. There were a large number of persons, as a matter of course, who wanted these syrups and who sent to us to get them, and we would send them five and ten gallon kegs, and they were very sorry when we quit our work. As a matter of course, if we had continued as we had hoped to do, we should have had a market for those syrups from all parts of the State, simply because of the unquestioned purity of the goods, and next because they would keep “forever and aye.” Some think the syrups that have not the acids in them are the same, but if you had had the experience with them that I have had on sugar-house syrups you would not think so. I think there is no doubt but what some persons find it to their advantage to use syrups that have been defecated.

Our friend Kenney has adopted the plan of using sulphur. He has got what he calls a sulphur house; I have not seen it for some little time. I do not now remember exactly its arrangement, but my impression is that it is about the same as any other. The syrup after going through the defecating tank runs through the sulphur house, where it is bleached by the sulphur smoke.

The process used by Mr. Hughes, who is a sugar chemist, and one of the best I know,—a man who was raised in a sugar house,—is to use the sulphur in his preparation with lime, for defecation. He says it is not quite sulphate of lime, but it is so near it that there is very little difference. I think his process is a little better than what is called that of sulphate of lime; he is using it in making sugar, and he says he cannot make sugar successfully without; he might make some, he might make a pound or two to the gallon, but if the cane is well grown and thoroughly matured, you can get five pounds of just as good sugar as is in that white sample there, from a gallon of syrup. The gallon of syrup will be heavier than people usually make in their common products, because there must be a certain consistency to the granules.

Any of you who have arranged to make a few gallons of syrup can adopt this course. This is the explanation of the difference between what is called a commercial process of making sugar and syrup, and the usual process, which we may all use, in which a man may use lime or not as he finds to his advantage. As was said by our friend, if you don't know how to use lime you had better not try it; but it don't injure the syrup for the uses of most people. I could not use syrup that had acid in it. I am a little dyspeptic. So with a great many others. The nicest quality of syrup is that which is completely defecated, thoroughly pure; and that will not be white syrup, either. The generation now coming up, even men that are thirty years old, have been taught to believe that clear, white syrup is pure syrup, and is the best to use. Thirty years ago the Belcher refinery, of St. Louis, used to make a very fine kind of sugar-house syrup. The process took all of the acid out of the syrup. They had a very large sale for their syrup, and when they sent out a barrel of syrup, it had been put through a process which made it pure. I bought a barrel of that syrup, and I never troubled myself about its condition or character any more than if it had been so much water. Nobody ever heard of a barrel of it bursting; it was simply pure syrup. It used to bring in the market about a dollar a gallon, or eighty-five cents if sold by the barrel. That was unqualifiedly the best syrup that has ever been sold in the United States; but to-day there is no sugar-house man that makes that class of syrups. We made that kind in our refinery simply because we didn't have time to reboil the syrups. After it was ready to crystalize we did not try to get the last grain of sugar out of the syrup, hence our syrups were better than anybody would find in this market that came from the East, or which was brought here, and when compared with ours there was no comparison between them. We sent a sample of it to Prof. Moore, who is probably the best sugar chemist in America,—Gen. Le Duc is acquainted with him—he is the chemist of one of the largest sugar refineries in New York City. He said, when he looked at this sample: "There is no such article as that made in America, now." He says: "That is a very excellent class of goods; it is too good for the general market in competition with other syrups." It was like the old sugar-house syrup that Mr. Belcher used to make thirty years ago; it had a large proportion of sugar in it, hence the difference between the two. It is not that defecated syrup is not better, but if you want it for use in the bakeries, you want

it with the acid. That is the reason they buy New Orleans molasses in preference to any other, if they can get it. It is very difficult to get. There is somebody in the way of that barrel getting to market; they have a special use for it. Now people had not asked yet how to make glucose syrup, but they do find that the amber cane syrups are in their way in the market. It was said, very properly, that anyone would take the amber cane first; consequently they have a man down there who knows what the price of it is; he will bring that and the glucose together somewhere; and they have stopped talking about the pure, clear white syrup to the people, and they have stopped selling it now; it is not fashionable now; it is not exactly the thing that recommends the syrup in the market, and that is what comes of a large proportion of the amber cane syrup, and almost all of the New Orleans syrup in the market.

There is imported into the United States 30,000,000 gallons of syrup annually. There is produced in the United States another 30,000,000 gallons of syrup; hence there are 60,000,000 gallons of syrup which, in one way or another, is grown, and which comes from sugar cane which is sold and used in the United States.

The syrup which is handled in the Baltimore refineries is re-boiled. For instance, syrup is imported into the United States and is rated at fifty-six per cent of saccharine matter; that is, the kind of syrup they usually buy. It pays a duty of four cents per gallon. Our Baltimore friends take it and they boil it. There is no end to the demand for syrups in this country. We need not have any fear that in your day or in mine there will be enough to supply the demand of the people.

Now I want to say a word about the manufacture of amber cane syrup. My friend here, Mr. Smith, has very aptly said that Mr. Kenney was once a poor man. A great result to him was the discovery of the sugar in 1877. He became enthusiastic; he spent the last dollar he had or could raise to buy machinery. He went to work upon his process, and he said to his neighbors that they could grow cane for him and he would pay them so much per ton, and he has got his neighbors growing cane by the ton for him to grind. Now, his machinery has not been sufficient to work up all the cane that he has had; he had to have the cane piled up in the yard. I have seen the yard full of cane, and piled up as high as my head and higher, and some of it would have to stand there perhaps for weeks. He used to

pile it up in that way and put leaves over it, and he used to describe the manner of piling it. It was a necessity to do this, as he could not work the cane up as fast as it was necessary to cut it. He had to leave it in the field, but he lost very largely by that process. There is no question that those of you who are growing cane want to cut it when it is ripe, and you want to grind it, if you can, the same day it is cut, and run it right through and finish it right up. That is the best use you can make of it. You can get more syrup, and that is the best way to dispose of it.

The Rio Grande folks gather their cane say to-day, and to-morrow every stalk of it is through the mill. They will use up about two hundred tons of cane in twenty-four hours. They put it through the mill right away. They will stake out enough to make two hundred tons, to be cut at one time, and run through the mill within twenty-four hours. Mr. Hughes, the chemist, will go down and examine the product, and if he finds it is not fit to cut he will bring the men home; but when it is ready he will order the men to cut the cane and put the whole thing through as fast as possible. He tests it with the polariscope to see if the cane is ready to go through the mill. Hence they cut it from day to day, regularly, and make sugar as successfully as it is possible to do it. You can readily see that it requires instruction and practice for a considerable period of time to accomplish all this. For instance, the man that was at the vacuum pan when I was at their mill was an old gentleman from Germany. Mr. Hughes asked him: "How long have you run a vacuum?" His reply was, "Thirty-three years." He asked him if he had ever done anything else, and he replied that he had not. That man knew how to boil syrup. He knew when he looked at it whether he would get any sugar. He knew exactly every moment of time whether the process was going on right or not. Mr. Hughes knew whether the boys who had charge of the defecating room understood their work or not. He had two or three boys down in the defecating room attending to the work. They put in the lime and whatever preparation was necessary, and when the defecation was complete they would turn a valve at the bottom of the tank and run the sediment into the scum pan, and when the clear juice commenced to run they had an arrangement by which they could turn it off by a valve, and everything was arranged to work in a perfect manner; everything reduced to a system the most complete, — the cheapest and most practical way

of making sugar. Hence there was no trouble with it whatever. They have improved their process of manufacture within the past few years. They keep a number of hogs, and they have a train of cars which carries the *bagasse* and the seed to a convenient point in the vicinity of the pens, and the seed is distributed to the hogs, and they use the *bagasse* to make manure, and in the spring they usually have enough manure for one acre of land for each hog kept.

Gen. Le Duc. Did they tell you the cost of the sugar per pound?

Capt. Blakeley. Well, they estimated that it would not cost them over two cents per pound. The year I was there they told me they had sold seed enough to pay for the crop. They estimated the cost of putting the crop through the mill at a dollar a ton. Now those of us who know anything about this industry know that amber cane can be grown so as to make it a paying business beyond the possibility of a doubt. Mr. Collyer has said that sugar can be made for one and one-half cents per pound. Of course, in order to do this you want to avail yourself of all the products that come from the crop. Mr. Kenney is paying two dollars and fifty cents per ton for cane, and every man that is growing cane for him is making more money from that than from anything else he could grow.

I had hoped to see our friend from Wisconsin, Mr. Powell, here at this meeting. He has always been here, and he comes through cold and heat, and is one of the most enthusiastic men we have anywhere in the business, and is making money out of it. Last year he lost his cane, but it didn't dampen his courage one bit. He said, "If I had lost my corn, that would not be a reason why I should not plant more corn." This year he has done well with his crop of cane. I have sent to Mr. Powell for a barrel of vinegar, as I have become tired of using muriatic acid for vinegar. Such vinegar as he makes ought to be more generally used; it would be healthier than the vinegar made and sold in the market.

The policy that this State should pursue, and especially at the schools, and which should be pursued by my friend Prof. Porter, is that all the boys that he graduates in the school should be put through a thorough course of training, and let them become educated on these matters, and by so doing they will find their knowledge a source of benefit to them in the future. When they go home they can impart information among their neighbors,

and when they examine a piece of cane they will know something about how much sugar there is in it. The boy educated in our schools should be able to tell about these things. It is such information as this that is going to be utilized, and in due time the business of making sugar will be a successful industry in the State of Minnesota.

A delegate inquired as to the difference in the cost of making by the different processes described.

Capt. Blakeley. I think Mr. Kenney will make more money by the process that he uses than Mr. Whipple will by his process. The cost of refining is not very great, and is not over a quarter of a cent a gallon. That does not amount to anything, really. The knowledge consists mainly in knowing just when you have to put the lime in and when you have enough of it in; you may spoil it by overdoing. It is the practice of a little skill which is required.

Gen. Le Duc. The process is very simple with the use of litmus paper.

Mr. Whipple. Mr. Kenney got about eight cents more a gallon than I did. I make my syrup and sell it. Mr. Kenney was an old schoolmate of mine. He used to get seventy cents for his syrup while I got fifty-five cents for mine; but I think this winter our sales are just about equal. We have had a good deal of demand for the crude syrup. I may say this, that these syrups will keep the year around, and I have never had any trouble. There are people who have handled other syrups and have had trouble with them. A syrup can be made a good deal cheaper and sold for less money, but after they have had one or two barrels burst in their cellars, they usually conclude they don't want any more. I am satisfied that some of our wholesale dealers are using the amber cane syrup and putting it into their "golden drips." I made this year about 2,000 gallons of syrup in twenty-six days, counting my time for stopping, cleaning pans, and everything, with three men and a span of horses, and drew most of the cane from the field during the time with the same team.

Mr. Smith. The expense would be about five cents per gallon.

President Smith. I bought some syrup from the Faribault refinery and have some of it on hand now, and it is as good as when I bought it.

Mr. Smith. The syrup usually has sugar in the bottom after it stands for a while.

President Smith. I bought it in ten-gallon kegs and I found that it kept all right.

Capt. Blakeley. A man that takes the ten-gallon keg of syrup is not disturbed about its keeping, for if it is not made as well as Mr. Whipple's is, or Mr. Kenney's or Mr. Powell's, it will keep. But if there is acid in the syrup and you start to travel any distance in the hot summer season it is bound to work, and it will soon make itself heard before it gets a great ways; there is no doubt about that.

Mr. Whipple. I have shipped my syrup to Dakota and never had any trouble in that way.

Some think that the acid injures the quality but there is one good thing about it,—some of our physicians tell me that the amount of lime that they have in the syrups is of advantage and that it counterbalances the acids; I don't know but they are mistaken. If anyone knows anything about that I would like to hear what he has to say.

Capt. Blakeley. No acid is necessary for me. I use the greatest care in my food in order that I shall not have any acid. I don't use it. I don't use even the vinegar that I bought from our friend Powell; but my family use it. It is because I have an abundance, and more than enough. There are plenty of people who require acid, but this is because of a difference in our systems. The instructions from the books are, as well as that of the best chemists of Europe, that you must get rid of the acid if you are going to make good sugar. What I am urging and what I think we must look toward developing ultimately in this country is the sugar industry as well as the product of syrup. We are all able to make syrup. There are many in the State who know how to do it and can make money out of it all the time; but one more step is necessary,—it is practical to make sugar in this State for two cents a pound, as I believe Gen. Le-Due will tell you, and as Mr. Collyer has told us, and he is indorsed by the Academy of Natural Sciences of the United States.

There is probably no better authority on these subjects in the United States than Dr. Moore, a man who gets \$25,000 per year for his services as sugar chemist. He unqualifiedly indorsed the whole thing. Not only that, but I had an extended conversation with Prof. Silliman, in which he expressed himself as not only gratified, but astonished, at the result, and they both believed it would be a success at that time. Prof. Silliman and Prof. Brewer

were very enthusiastic. Gentlemen, this is not a delusion; it is the truth. All you want is the necessary information in order to enable you to make the most beautiful sugar the earth has ever produced, and it can be done on the broad prairies of Minnesota. Our friend Prof. Henry knows all about it. He tells you that over in Wisconsin they have made sugar, using a little pan, about thirty inches across; and according to their estimate it only cost them about four cents per pound.

I want to say a word about beets. In 1747 A. S. Marggrof, a German chemist, declared that there was some sugar in beets. It went for sixty years before his statement was confirmed by one of his scholars, K. F. Achard, in 1799, who presented a sample of sugar to the Institute of France.

The Institute of France and other chemists continued experiments confirming Achard's statements up to 1810, when it had become a necessity because of the war between England and France that some means should be devised to procure a supply of sugar for France. When this subject was again taken up by M. Proust, an able chemist, who made sugar from grapes, and M. Fouques, who found a means of bleaching it and giving it the color of cane sugar. This new and interesting progress in development of the discovery of Messrs. Marggroff and Achard was brought to the attention of Napoleon by his minister of the interior, and his majesty issued a decree that there should be granted M. Proust \$20,000, and to M. Fouques \$8,000, to establish this industry, and made M. Proust a knight of the Legion of Honor, and on Aug. 18, 1810, the minister of the interior addressed the prefects of the different departments of France on the subject, urging them everywhere to establish this new industry. The closing paragraph of this letter of the minister was as follows: "Let manufacturing establishments multiply everywhere. Let it be considered, M. le Prefect, that this is a sort of war we are making against the enemies of the continent, and which his majesty considers, more than any other sovereign, worthy of recompense to those who make themselves prominent in the ranks." This is the way the beet sugar industry began, and all the world knows what it is to-day; and sorghum only wants a similar friend behind it to have a still more complete success.

Prof. Henry. You have not told how when Napoleon fell the price of sugar fell. That is an important consideration in looking at the history of the industry in that country.

Capt. Blakeley. When Napoleon fell the people of France soon learned that it was necessary to protect them by law. They found that the cheap sugar of India could be made and sold for less money than they could make it by the use of beets. But they "walled up" the industry, gentlemen. It costs to-day eight cents a pound to get sugar into France or into Germany; but you can get it out for a good deal less money. That is the secret.

Prof. Henry. We hear to-day about some of the sugar factories going to the wall. It is said that after Napoleon's downfall all of the sugar factories of France went down but one. They gradually started up again and to-day, with a protective tariff, they have between four and five hundred sugar factories in France. We find a parallel in our own history in reference to the business of sugar-making.

Capt. Blakeley. Sugar cannot be made at the prices at which it is being sold. It is simply like selling wheat at twenty-five cents a bushel. So it is with corn. We cannot get its value when we have to burn corn. It will always cost a certain price to raise it, consequently it must be worth that; and so it is with sugar. The people of Germany are as much in trouble as anybody else about this matter. Their sugar business is with them a national industry; it involves millions of dollars, and there are thousands of people engaged in the business. It is indispensable as a rotation crop. They get a large amount of feed from the beets for their cattle, and they get a large amount of manure for the land. It is almost indispensable as a crop for rotation.

This is one of the theories of the growth of the sugar interests of this country; and because of the difficulties that are to be overcome there should be an earnest effort to bring to bear all the practical knowledge that can be gained, and all the skill and adaptation of one part to the other that is practicable. I might say here that there is one institution in France, a sugar mill, that has forty-four miles of pipe that carries the juice of the beets from the different farms all around that plantation to the factory. The beets may be grown away over here or away over there, but the product is conveyed to the mill by these pipes. They send out word when the supply is to be sent in from one locality to one man, and then at another time send word to another, and so on. It would be utterly impracticable for the teams to get to the factory with the amount of beets which are manufactured into sugar and supply it with the amount of mate-

rial necessary to run it. There are fifteen hundred men at work in the factory, and there is not a beet brought to it. You have no real conception of what an immense industry the beet industry really is until you commence to study it. But I have taken too much of the time and you will have to excuse me; I am a little enthusiastic about sugar and don't usually know when to stop talking.

A delegate here inquired if there was any way of disposing of the *bagasse* so as to use it to advantage as fuel.

Prof. Porter. I have seen a machine in operation on some of the plantations in Louisiana that takes care of the *bagasse*. There is attached to the crusher a carrier with an endless chain and it conveys the *bagasse* away very much like the straw carrier to a threshing machine. In the passage it becomes so dry that it will readily burn as fuel. There have been a number of inventions brought into use for disposing of the *bagasse*. Anyone who desires a fuller description can send a dollar to Mr. Colman as a subscription to Colman's *Rural World*, and that will give one a great deal of useful information. It will be the best investment he will ever make for one dollar if he ever expects to become thoroughly posted in sorghum culture and manufacture.

Mr. Whipple. I will say that after reading that journal for several years that you will find out by that how to get rid of the *bagasse* as well as obtain much other useful information.

Capt. Blakeley. It is the organ of the amber cane interests of the Mississippi Valley. Mr. Colman has almost always been to our annual meetings. I wish to say that I attended the meeting in Wisconsin two years ago and was well repaid for going. We had a remarkably interesting session. There were a great many present who were well informed in regard to this industry. We were all gratified at the results which were shown to have been accomplished thus far. We felt that we had made an advance that was beyond a question. The report that was made of the meeting was a very correct one; we had a good reporter, who made a very accurate report of everything that was said. There were a good many interesting items of information contributed by the different persons who met upon that occasion and many valuable suggestions made. I have sent to every member of our association a copy of the report so far as I knew them by name. I have still a few copies left. I have no doubt it has been a source of profit to many, for all these things were very carefully discussed in that report.

Gen. Le Duc. In regard to the burning of *bagasse*. If you have a machine that will split the cane and get the juice all out, and have a good chimney of brick, you will be able to feed the *bagasse* directly to the flames so that it will be practicable to run your furnace. There is no doubt of that; I have seen it done and have done it myself. The great question before us here now, and before those who have assembled year by year to discuss sorghum matters is, I think, *what shall we do to make some money out of the sorghum?* That is the practical question that lies at the foundation of all the interest that we take in it. But there is a broader question than that and one that lies at the foundation, and that is what shall we do in order to produce in this country everything that can be produced by American farmers, rather than to use those things that come from abroad, produced by some other country? We will surely profit by this. Even if we seem to be making no money, still if we work within ourselves to supply our own needs we as a country are making money out of that. This was a question which came to me in my official position: How can this country save to its people that great amount of money which is flowing away to other countries?

In that country that I told you about I had a good deal of communication with the people. I was in the country that Prof. Porter has told you about. I had with me a sample of Minnesota amber cane sugar. I had a bottle of syrup made by Mr. Kenney, and after they had gotten through with their congratulations we fell into a discussion. They said, "This is open pan work?" I told them, "Yes, I believe it is." "I suppose it was some that was made in Texas or in Georgia?" "No, it was not made in Georgia." "Where was it made? It was not made of cane?" "No; it was made out of a kind of cane; it was made in Minnesota." There were there twelve gentlemen at the time; men who had spent their lives at the business, and some of them who had fortunes of \$250,000 each, perhaps, invested in sugar mills. They looked at it again and again and they said, "It cannot be possible that you are telling us the truth!" "Yes," I said, "that was made in Minnesota, and it was made by a farmer, and it was made in open pans." "Well, by the gods!" said one of them, "we are done, boys, we may as well stop!" and they sat down and stopped and looked, as much as to say, "these Yankees up North are going to beat us to death!" They knew the kind of labor we have to do our work and that they

could not compete with the intelligence of Northern people. They knew that if sugar could be made by a farmer of Minnesota without expensive machinery, without the centrifugal and the vacuum pan, that we could make it cheaper than they could. I tell you that sugar can be made for less than a cent a pound, paying all expenses, under favorable circumstances. Their sugar at the Rio Grande works does not cost them a cent a pound to-day. They have reduced the expenses and placed them elsewhere so the sugar don't cost them a cent a pound.

Capt. Blakeley. Have you seen the Rio Grande works since they have adopted diffusion there?

Gen. Le Duc. No, but I have kept up with that. The question comes up to me as it has with Prof. Porter, which is this: Is not this treaty with Mexico going to be prejudicial to our interests in making sugar in this whole country? The professor was not in when I was telling about the kind of people they have down there. The people with their present degree of intelligence down there will never be able to compete with us of the United States. It is not because they have so fine a soil that they may be enabled to excel, for that is only one item in the account. Their land for sugar-making is limited. The greater portion of the area of their country is not subject to the rainfall which is necessary to the growth of a crop of sugar; their sugar cane must go ten, twelve, or fourteen months before it is cut. The rainfall there depends largely upon the travel of the sun to the north, with an atmosphere that brings moisture. Instead of the tropical rains there is drought for six months and then practically rain for six months. That affords a very small area in which to grow sugar. You cannot make sugar there in a dry season without irrigation. As the world grows older the increase in the amount of sugar is larger than the increase of population. That is because sugar takes the place of other kinds of food; it takes the place of meat in a large degree. The population of Mexico will need the increase in the sugar for the next ten or twenty years. In the next ten or twenty years, if the people of this State will put themselves to work as they ought to, and if this State will encourage this industry as it ought to do, there is no question or doubt that you people will be enabled to raise your own sugar as you may your own grain. It may even be one of your large exports. I say this in all earnestness. I say think of it and study it, and do so with the purpose of making your money out of it. I should like to see this crop cultivated as a leading industry of the State

and one which the fertile soil of ours may produce in such an abundance that we might have a surplus to send abroad.

Mr. Day. If there is no further business I would move that we now adjourn.

The motion was carried, and this closed the transactions of the Amber Cane Association.

EVENING SESSION.

WEDNESDAY, JANUARY 21, 1885.

The meeting was called to order at 7 o'clock P. M., by President Smith. He called attention to a beautiful collection of flowers presented by Mr. William King, of St. Paul.

President Smith then introduced Mrs. Anna B. Underwood, of Lake City, as the pioneer orchardist of Minnesota, who proceeded to read an essay upon apples.

The following is the paper read:

ORCHARDING IN MINNESOTA.

BY ANNA B. UNDERWOOD.

Mr. President, Ladies and Gentlemen:

Your committee asked me for an account of my orchard, and the labors connected therewith, and it gives me pleasure to contribute to our society's program in this way.

Although cognizant in a general way of what had been done in this orchard from its first planting, I only feel qualified to speak particularly of its management and results since it came under my control. This orchard has always been the pet of the family, and, like most pets, it has given its natural guardians considerable anxiety, connected with hard work, to properly guide its growth into a fruitful maturity. The most favorable situation for an orchard is generally conceded to be on a high northern exposure. The location of this one has always been regarded as unfavorable, as it is on a flat bench of land where it gets the full force of the sun in summer and in winter, which makes the temperature more variable than it would be on a high northern slope.

Owing to the pressing duties connected with the nursery busi-

ness the orchard had not been as well attended to—particularly in one respect—as it richly deserved. Aside from this (which will be referred to again later on) it had been well looked after, amply repaying the time and money spent upon it. The cattle—which in many orchards are permitted to roam around at their own sweet will, doing all the pruning and cultivating that is ever given—have never been turned in to browse around the trees; neither has the sod been allowed to grow between the rows. From the time the trees were first set out, they have been thoroughly cultivated each season in the rows running north and south. While the trees were young and until the ground was too heavily shaded to do it, one row of corn or something else has been grown between the trees. This last season I planted raspberries and blackberries between some of the orchard rows, hoping to gain protection for them. At the same time the cultivation necessary for their growth will be beneficial to the trees.

The soil is a sandy loam with a clay subsoil and is really a genial home for the roots of trees, although our hot August suns cause it to mature the fruit early, and make it difficult to keep. The situation of the orchard has one element that is both desirable and objectionable, and that is a free circulation of air, but when it comes to us in the latter part of August with a force that precipitates to the ground two hundred bushels of apples a day for three consecutive days, we think there is a “leetle too much air stirrin.” It is at such times, too, that the sun shines so hot as to literally bake large Duchess as they lie on the ground from 10 A. M. to 2 P. M., and we can only hurry them in to a cool place to be sorted and disposed of as best we may. But I fear you will think that I am describing a poor orchard, poorly managed, which certainly is not the case. For while it is yet but a young orchard, the greater part of it having been set but nine years,—the balance one, two and three years later,—I have for the past two years marketed forty to fifty dollars worth of apples per acre to say nothing of fine returns from it before that time. Most of the trees are set 12x14 feet, the rows being fourteen feet apart. The largest portion of the orchard has been seeded down with clover, that is a strip about four feet wide in the row. Clover is better than other grass, as, owing to its branching, spreading habit, it is more yielding to the falling fruit. For another reason it is the best, and that is its fertilizing qualities. It also makes good mulching for the trees.

There are in all between 4,000 and 5,000 trees in the or-

chard, about three-fourths of which have borne more or less fruit. The varieties are mainly Wealthy, Duchess and Tetofsky. Next in quality are the different varieties of the hybrids; then in small lots are a number of semi-hardys, such as the Haas, Walbridge, Drake, etc.; and finally, to close the list, is an experimental orchard of several Russians and Minnesota seedlings that are undergoing the test for hardiness and quality. A great many of these have been found wanting, and another season the trees will be top-worked to some other varieties. It rather dampens one's pomological ardor, after growing for three or four years a cion of some apple with a name of several syllables, indicating that the fruit possesses all the qualities that *the* apple should, to find that the fruit has the same delicate flavor and fine grain (and I was about to say size) as an acorn! We have several worthy varieties now, like the Wealthy, Duchess, etc., and it seems to me that a certain scale of points ought to be decided upon by which new varieties should be tested before throwing them broadcast over the land to load our orchards with unprofitable varieties.

The Duchess orchard has had a vacation for the past two seasons. In the spring of 1883 there was a severe frost that killed the blossoms and young apples. It was quite interesting to note the susceptibility of the different varieties to this late freezing, the best to stand it being the Wealthy and Orange. This last season not over fifty bushels of apples were gathered from the Duchess orchard of about 1,400 trees, that should have produced as many bushels. This fruitlessness I attributed to a tremendous down-pour of rain just at the time this variety was in full bloom. Most of the hybrids suffered by the same fall of rain. The Wealthy, blooming a few days later, were heavily loaded with fruit, constituting the main crop of the season. I think I made a mistake in allowing them to fruit so heavily, for by the time the last barrel of apples was gathered the Wealthy trees looked very tired and weary, which was not to be wondered at, considering the quantity of fruit they had borne. The Duchess, standing by the side of the Wealthy, looked so strong and vigorous, thoroughly refreshed and ready for their coming winter struggle, that I then and there resolved I would not again overwork a tree that I cared anything for. Another season will try what systematic thinning will do. It requires the free exercise of all the courage and will power a mortal is capable of to deliberately destroy a third or half of the fruit after it is set, particu-

larly here in Minnesota where we have to submit to the idiosyncrasies of our spirit thermometers, which will persist, in spite of all protestations and ejaculations, in registering all the way from fifty degrees above to forty and forty-five degrees below during twenty-four or thirty-six hours, and not only once but two or three times during a winter. These sudden changes are liable to destroy the fruit buds, and when, after a fruitless season, the trees are once more set full of fruit, it is a great temptation to let every one grow. But the tree will winter better if it has been kept in good growing condition and not stunted by bearing too heavily. The trees have been pruned but little; when a branch seemed to seriously interfere with another it was removed, and this, with the cutting of cions for grafting, has been all that was necessary to keep them in good shape.

There were several weeks this summer of very dry weather, that militated strongly against the size and quality of the fruit. An occasional cloud would bring hopes of a thorough soaking, but it would leave us with hardly enough moisture to lay the dust. Quite often it would be accompanied by heavy winds that would threaten to uproot every tree. Sometimes the apples would present a bruised appearance on the trees. As a consequent result of this lack of moisture, high, drying winds, etc., there were a great many undersized immature apples that were useless for any purpose.

In gathering the apples from the trees I used bushel and half-bushel baskets to pick into; when full they were carried to the ends of the rows, and from there were carried to the apple shed on hand-carts. The utmost care and watchfulness had to be exercised over the pickers in order to have the apples laid in the baskets and not thrown in. Even after explicit directions had been given the picker relative to the proper handling of fruit, the reasons therefor given, and in addition, the fact, demonstrated by actual illustration before the eye, that an apple will not stand without injury the same banging that a stone will, the picker was occasionally unable to resist the temptation to save a few steps by giving an apple a toss of a foot or two, although he well knew that by so doing not only the apple thrown but the two or three hit in its fall were more or less bruised. These bruises would not show at the time, but eight or ten hours would develop ugly black spots that would condemn them at once as first-class apples in the eyes of purchasers. When wanted for shipment, if to go by express, the apples were carefully sorted

and placed in bushel baskets, the covers pressed on firmly to prevent shaking of the fruit. Then a lath was passed over the cover of each and through the handles to keep the cover in its place. Apples were only sent to near markets by express. If they were to go long distances they were just as carefully sorted and packed in barrels, and sent by freight.

In spite of all the difficulties of the past season, and failure of the Duchess to bear, I marketed about 1,300 bushels, and could have sold as many more without any further effort, as the demand far exceeded the supply. Our Minnesota apples, particularly the Wealthy, are so highly colored that they find more ready sale in market than the Southern grown ones, and we all know that there is no apple grown anywhere that excels the Wealthy in beauty or quality.

The first of August found the Early Strawberry ready to be gathered. This hybrid, coming as it does right after the raspberries are gone, is especially desirable, as at this time fruit of any kind is very scarce in the market, and every housekeeper is wondering what she will have for sauce, pies, etc. When ripe, owing to its mild, sub-acid flavor, entirely free from bitterness, it is a delightful little apple to eat out of hand. A fruit dish filled full is a nice ornament for a parlor table, well appreciated by callers, who, after trying one of the "crabs" at your earnest solicitation, are so surprised to find "that it tastes as nicely as any apple," and they need no further urging to eat a dozen more. It really hurts my feelings to have people persist in calling this hybrid, with some others I might name, "crabs;" for the name "crab" alone will pucker one's mouth before a bite is taken from the fruit. I will here give a way of cooking this hybrid, which applies equally well to the Orange, that I find is not generally known or used, most everyone thinking they are only fit for jelly and pickles. Put the apples whole, without stemming, coring or paring, into a saucepan, with enough thin syrup to cover them; let them cook slowly until done. The juice will be of a delicate pink color; then pour them with the juice into a sauce-dish, and when thoroughly cooled they are ready for the table, and a most attractive dish it is to look at and to eat. Some sprinkle a little cinnamon over them while cooking, but their own sprightly flavor is the best, in my opinion. The Duchess, what few I had, came directly after the Early Strawberry. This is a fine market apple, as, on account of its high color and size, it is very attrac-

tive. Its only fault is, when fully ripe it does not stand shipping long distances well. For near markets it is splendid.

The Wealthy begins coloring up about the last of August and the first of September it is ready for market, and from that time on, as long as you have any on hand, it is *the* apple—although I did find one person last fall that preferred the Haas for eating!

I would like to speak particularly of the Orange. This hybrid, when mature, is of a bright orange color. Jelly made from it is very light colored and better flavored than when made from the crabs, as it is entirely free from bitterness. Cooked in the manner described above for Early Strawberry it makes a sauce, as the girls say, just too lovely for anything! The bright, orange color of the skin is not affected by cooking; the juice is perfectly clear, and it really makes a very dainty dish. It is very juicy, never getting dry and mealy, and when fully matured is pleasant eating. This is a popular hybrid in our city, and this season did not have enough to supply demand. Other seasons have put away one or two barrels for winter use, but had to let the last bushel go to fill orders this year. Winter before this we used the last some time in February. Presume they would have kept longer, but there were none to keep. The Orange, Early Strawberry and some others of the hybrids have such thin skin that they do not need paring, which is another feature making them especially desirable.

A few words about Beach's Sweet. It is a delicious, sweet apple for eating, and for canning it is equal, we think, to California pears. They want to be pared and cored whole with a small knife or apple-corer. Steam them until tender, then put them in the glass cans, and while warm pour over them a thin syrup, scalding hot, filling the can and sealing at once?

There are other varieties that I would like to mention particularly, giving their good or indifferent qualities; but my time has been too limited and it would take too much of your patience to listen.

A little while ago I said the orchard had not been well attended to in one respect. The trees, although in such an exposed position, had never been protected in any way. The necessity for it has been realized for many years, but lack of time to give it the personal attention required has postponed it from year to year. A serious injury the orchard has experienced has been from the sun during winter. This is indicated by the injury being only on the south side of the trees, and the trees at

the south end of the orchard showing more hurt than those further in.

All the season through this was the subject of many consultations with different persons. The main object desired was to secure a protection that would combine cheapness, durability and efficiency.

As soon as the apples were all disposed of, which was about the last week of September, preparations were at once begun to get the trees ready for winter. First the bodies were cleared of all dead places, loose bark removed, where the water might stand; all dead limbs cut away. After this each tree was gone over carefully and thoroughly waxed where any whittling or scraping had been done. Also the crotches of the main branches were waxed as far as they could be reached conveniently. During the operation of scraping and cleaning, a great many eggs—of what I know not—and worms of different kinds were unearthed and destroyed.

The next step was to obtain lath and binding wire. Five or more laths, according to the size of the tree, were then woven together, about ten inches from each end, with the wire. The ends of the wire were left long enough to complete the distance around the tree and fasten loosely. These shields were then placed on the south side of the trees. The cost of these shields, including the wire, time of making and putting on the trees, was a trifle less than three cents per tree. The cold weather came a little too soon for me, as I intended to further protect the trees by laying bits of burlap on the south side of the larger branches that the shields could not cover. Another fall will see that this is done also, for the more perfect the protection we can give our trees from the winter sun the better their condition at the opening of spring.

One word with regard to the worms in the apples; they are increasing every year, and unless some radical measures are taken to prevent their increase our orchards will soon be worthless. London purple has been recommended to me as being the best preventive, and this coming spring I intend to use it thoroughly. Secretary Gibbs gives the best method of using it, in the report for 1884.

The paper of Mrs. Underwood was received with applause.

President Smith inquired how many apples Mrs. Underwood had sold from the orchard in the year 1883.

Mrs. Underwood. If I remember rightly either 1,400 or 1,500 bushels, making in all about 3,000 bushels in two years.

Mr. Smith moved a vote of thanks to Mrs. Underwood for the valuable paper furnished the society and that she be made an honorary member for five years.

Mrs. Underwood. I believe I would rather object to being made an honorary member, for I would prefer being an active member of the society.

The motion to tender her a vote of thanks for the paper, and that it be published in the report of proceedings was carried unanimously.

Mrs. Ida E. Tilson, of West Salem, Wis., then read a paper upon "The Relation of Poultry-raising to Horticulture." The reading was listened to with close attention and received with applause.

THE RELATION OF POULTRY TO HORTICULTURE.

BY MRS. IDA E. TILSON.

There is an old newspaper joke which claims hens, like plants, are set, and eggs resemble roses, being propagated by layers. This paper, however, proposes to treat its subject in real earnest. Neither horticulture nor poultry-raising requires large capital. A little money buys many seeds or fowls. Either business is most practicable on small areas. Poultry cannot range like stock. A few acres of fruits and vegetables, with their constant weeding and cultivation, are equivalent to the demands of a whole farm planted in coarser crops. It is therefore surprising that he who has a small capital, a small farm, or both, does not oftener combine two such harmonious industries. When statistics of either business are considered, it is equally strange that men will risk new country privations to secure large farms, instead of subdividing old lands in settled communities, and trying these remunerative employments. A late paper estimates the French eat, on an average, one hundred and fifty eggs apiece each year. In the United States about \$30,000,000 worth are annually consumed. Not long since, some statistician astonished one of Wisconsin's well developed counties by proving its horticultural products had, that season, netted more than its combined stock and dairy interests.

Often two crops, fruits and fowls, can be grown in the same enclosure without detriment to either, but, on the other hand, with great advantage to both. If a flock are, in number, pro-

portioned to the size of their run, they will cultivate the ground well, allowing no hard crust to form on its surface, nor weeds to flourish, and will tear apart, pulverize and work up into a compost all sorts of old rubbish. Biddy's worst enemies admit she can do that to perfection. Many grubs and insects, conveyed to vegetable quarters and flower beds in fertilizers, are found and eaten. All this while the birds themselves are enriching the land. The guano of commerce not always comes from Peru, but sometimes has its origin in American poultry yards, and is all the better for that, as chemists think no fertilizer is superior in condensed strength to this home-made product. Can earth-worms, so praised by naturalists, do more than Biddy has done thus far? Then is she not entitled, when warm weather comes, to sit under shelter, so to speak, of her own vine and fig tree? Trees and plants afford a sure protection from hawks. Poultry need shade for comfort, and, throughout the year, green food for health. Undersized and injured vegetables, of all kinds, seem to suit their tastes and constitutions quite as well as sounder roots. What horticulturist hasn't unsalable produce, a dead loss, except as swine or fowls transform it? If this subject were a little broader, agriculture instead of horticulture, the market fowls make for cereals would be an important consideration, also their utilization of screenings, etc. The chemical constitution of a soil is believed to affect the color of their plumage, not so much by direct contact, as through the digestive organs and blood, because they eat not only vegetation growing out of this soil, but more or less earth itself. A variety and abundance of mineral matters produce dark and vivid tints. Lime and phosphorus tend to symmetry of form and vigor in carriage. Ammonia induces sprightliness. Gardens are yearly enriched with fertilizers, both natural and manufactured, which contain these very elements, and such situations cannot but prove favorable to producing high-bred poultry.

Horticulturists wage constant war on insects, and make a large annual outlay for powders and other compounds to destroy these pests. But the *New York Tribune* says: "London purple, Paris green, and other deadly and enduring arsenical preparations may well be included in the black list. It is time honored entomologists ceased to lend their influence in favor of such perilous stuff, which, recklessly scattered as it is in immense quantity, poisons the land and the fountains of life." The *Rural New Yorker* unites in this protest. Not that any person or many animals

have actually been fatally poisoned, but, as in adulterations of sugar, syrups, etc., injury is no less because it comes on gradually and insidiously. Insectivorous birds and animals, on the contrary, are natural and safe allies for horticulturists. Prof. King, of River Falls, who has examined stomachs of many hundred birds, thinks not more than thirty-five per cent of the robin's food is fruit, and, therefore, commends this generally distrusted and persecuted bird. As fowls are usually made to fast a while before being killed for market, it is difficult to determine just what proportion insects form of their food. An acquaintance tried, by dissecting a number of sick individuals, to learn the secrets of some mysterious malady visiting her flock. She was surprised at the large number of familiar insects found in the crops even of these partially disabled hens. At least cherries, raspberries and blackberries grow out of reach of fowls, and it can fairly be inferred they destroy less fruit than robins do. Let a few additional plants be allowed for them, and they will save all from overbearing, a thinning out by hand not often being practicable. Moles have many friends, and toads are a regular article of commerce, being imported to England from Denmark at the rate of five dollars per hundred. But moles frequently eat off roots and make unsightly mounds of earth. And finally, in the comparison of merits, domestic fowls cannot fail to outrank wild birds and insectivorous animals, because, unlike all others, they are themselves a source of profit. Here again is reverse action. With insects or some other meat for food, an extra production of eggs may be expected.

A list of such injurious insects as poultry are actually known to eat will add positiveness. A friend has called my attention to the Illinois Horticultural report, of 1883, on the chicken remedy for sorghum plant louse, and the Michigan Pomological report, of 1877, on the same remedy for curculio. Not only plums, but apricots, peaches, cherries, apples, pears and quinces are attacked by curculios, hardly a fruit escaping if these insects are abundant. When plums are about as large as peas, the curculio stings them, making incisions in which she deposits her eggs. Fruit, weakened by the gnawing of the grubs which hatch, falls before ripening, but by this time its grubs are ready to pass through other changes.

Prof. Kneeland, of Boston, says poultry running about the trees will devour many larvæ before they can enter the earth. Full grown insects, shaken from a tree or disturbed, remain

motionless, feigning death for a time, when possibly, they might also be discovered and eaten.

Prof. Sturtevant, of the State Experimental Farm at Geneva, New York, placed a dozen hens in an inclosure of fifty trees. Only three per cent of plums were stung, while all outside were ruined. Pea weevils proceed in a similar way with half-grown pods. In a row of peas, where I had discovered these pests, not one could be found after some hens had investigated them, and a fine crop resulted. It is generally admitted that crows, blackbirds and Baltimore orioles devour great numbers of these weevils. So many have actually seen poultry eat potato bugs, especially young bugs, their names would make too long a list, though among them may be mentioned J. C. Plumb, of the *Western Farmer*. Cut worms remain under ground by day, and their only effectual preventive is frequently to dig about infested plants and kill what worms are found, surely a suitable work for chickens; and Secretary Gibbs, of this society, testifies he has had several hundred strawberry plants thus cleared of worms. He also mentioned a neighbor who bought five hundred or more plants from him, and gave his chickens full range among them. They were free from the leaf-roller's ravages, while Mr. Gibbs' own plants, not so cultivated, were injured. Wire worms are often hurtful to wheat and garden crops, including strawberries and potatoes. I cannot please my hens better than by disclosing a haunt of these insects, unless indeed, I gather the worms myself and feed them out in a mass. If the biddies cannot, like Oliver Twist, call for more, they look their appreciation. Snails and slugs are less common here than in European gardens, where, on the authority of Appleton's Cyclopædia, they are often too numerous, and the matter is remedied by fowls. Angle worms, in great numbers, sour or poison soil, and no one of any experience in gardening can deny hens' fondness for them, nor for that famous corn and grass destroyer, the white grub, as well as for grasshoppers, which also become formidable through numbers. Biddy will trudge behind a plow half a day at a time, devouring grubs thus brought to the surface. President J. M. Smith, of the Wisconsin Horticultural Society, is as noted for his fine currants as for his leniency to hens. The late Mrs. Lewis told of a friend in Mazomamie, Wis., whose roses, free from slugs, are a perpetual wonder. Their owner, however, divides all compliments with the feathered helpers. I have seen poultry eat bee, wheat, and cabbage millers, and in fact various others,

which I have not identified. This is an important consideration, for all kinds of plants and trees, fruits, grease, meal, clothing, carpets, and furs are subject to the ravages of moths. Any warm sundown, when millers are flying about, young chicks with all youth's enthusiasm, may be seen chasing them. A hen will stand motionless over a cabbage plant half an hour, Micawber like, waiting for a miller to happen along. Such an authority on Southern horticulture as ex-Commissioner of Immigration Dr. S. French, of Florida, expressed to me his high valuation of hens in orange groves.

Training doubtless will avail much. A friend tells of a pet cockerel that came at his call to dig for worms. A hen of mine, Twilight by name, was equally acute. Another, Gertrude, having been fed many wood-grubs, to this day lingers about wherever she hears an axe.

A correspondent of the *Country Gentleman*, in an article which has been widely quoted, rather sneers at the guess work of those who praise fowls for fruit protectors. I have, therefore, made my statements as definite and minute as possible, and extended my observations and inquiries through more than one season. He has, for instance, repeatedly offered his hens curculios, which they would not eat. That there might be no failure to see them, he laid his specimen beetles on a white plate. Now you are all witnesses that hens are not accustomed to dining on china. Where one bird would catch the idea of such an experiment, ninety-nine would stand agape at the man's maneuvers. That I might demonstrate his folly, I have served their favorite angle-worms, white grubs and crickets, in style, on plates. Only one or two of my flock, and those known to be especially bright and aspiring individuals, would partake. Insects eaten freely in their own way and time, they are generally too startled to notice or accept when thrown at them. Such is not a fair test, either, for those friendly and helpful bugs which horticulturalists do not wish destroyed.

To know positively what animals do not eat, would require an almost omniscient eye. Under a great variety of circumstances, I have known these birds we are considering, to pass unnoticed or to refuse the valuable lady bug, destroyer of plant lice and potato beetles. A lady friend, a great lover of gardening, sustains me in this statement. Man can hardly estimate the benefits conferred on him by the little ichneumon flies, which keep in check gall insects, Hessian flies, caterpillars, potato worms and

a host of others. But these flies are very rapid flyers, and taken with difficulty. I have never seen fowls attempt their capture, although they are so common. Prof. Trelease of the Wisconsin University, calls the golden-eyed or lace-winged flies too fetid for anything's appetite. Dragon flies, beneficial by destroying gnats and mosquitoes, are also exceedingly swift in their movements, and not only that, but high in their flight. As they frequent pools and aquatic plants, not one poultry-yard in a dozen is so located as to give its inmates even an acquaintance with them. Prof. King unites with Prof. Trelease in a belief that chickens can, from the nature of the case, do no considerable damage to useful insects. The *Gardener's Chronicle* is not afraid to take the same stand.

Perhaps no one will object to such conclusions as have been reached. It is, however, for her supposed wanton and unnecessary destruction, her scratching up things, instead of cultivating around them, that biddy is chiefly hated. Is not her aim, extermination of bugs, and her injury to plants, incidental or accidental? Her purpose accomplished, does she ever again disturb the spot? The peas, before mentioned as attacked by weevils, we thought ruined by those hens which overhauled them. They were twisted every way, some plants nearly uprooted. In a few days, though, they straightened up, took new hold, and yielded excellently. Now, their work done, did our feathered gardeners ever return to them. A fence a yard high, knit of course carpet twine, in meshes an inch square, and, at intervals, fastened top and bottom to slender poles driven fast in the ground, is said to make a complete barricade against poultry of any kind. It is graceful, nearly invisible, and suitable for hedging in flour beds. Mosquito-bar, though less durable, answers very well, so reports a *Western Rural* correspondent. Mr. Hildreth of Massachusetts, owner of a large establishment, a farm, six hen-houses, eight hundred hens, etc., finds a movable fence, one lath high, made in sections, keeps them in bounds. Nor when brought up in a garden from the first, are they so likely to do damage as when they are only allowed in now and then, or get in by chance, reminding us of the hungry boy at a picnic. Our hens have access to all the premises, and we have an abundance of garden stuff to bestow on our neighbors, as a consequence, we believe. Undoubtedly, too, there are seasons and occasions when fowls will have to be confined in their yards.

The relation of poultry to horticulture is a worthy study, yet

in no sense is this paper expected to be decisive. Its aim is suggestiveness. How much loss and disappointment jumping to conclusions has occasioned in every industry, cannot be conjectured. Hens have been referred to most often because I am best acquainted with them. Ducks and geese are not practicable in every situation.

Turkeys are more voracious, but their crops are fatally tender when young. A clipping from a California paper says: "The wine-growers whose vines are suffering from the ravages of slugs, are employing turkeys to devour these pests. The thing works well. The turkeys like the slugs, the slugs cannot get away, the vines are saved from destruction. The owners of slugs, vines and turkeys are contented. Turkeys grow fat while thus earning their own living, for one of them is said to destroy more slugs than two men can." A New York paper tells of a farmer who keeps a drove of turkeys, and rents them out to other farmers whose crops are troubled by grasshoppers. They were found, in that section, good to destroy potato bugs also.

Some aesthetic and ethic considerations deserve a passing notice in conclusion. Mrs. R. B. Hayes, wife of Ex-President Hayes, is noted for her exquisite taste. A late visitor to their Ohio home enthusiastically declares she owns some of the finest fowls west of the Alleghanies. Stone deer, favorite ornaments on lawns, seem incongruous unless grounds are large and romantic. A live deer would certainly be out of place in confined areas, and among choice evergreens. A flock of hens in which there is choice of color from black, white, red, yellow, to ringed, streaked and speckled, can be made as effective as a flower bed, and far more kaleidoscopic. "Like man, biddy does not wish to live and die "unwept, unhonored and unsung." No animal responds quicker to application. Let her see she is liked and valued and she rises constantly in the scale of intelligence, is obedient through life, and, after death, lives in the memory of those who eat her.

Mr. Gideon moved the thanks of the society to Mrs. Tilson, for her interesting paper and that she be requested to furnish a copy for publication. The motion was carried.

Mr. Harris. I have listened to the reading of the paper with a good deal of interest. I knew for some time that Mrs. Tilson had this paper in preparation, and I had promised to furnish some little items, but for some reason this past summer I did

not get around to do it. Poultry are very useful in a garden. But it is a fact that if you send down East and buy a package of seeds that are new and very choice, and if you dig up a nice place for them, you will find, if there is an old hen and her chickens running loose, that she is bound to find that particular place, and she will dig them out in a hurry. But if you will let the chickens run and tie up the old hen, you will not find that trouble with those choice seeds. Usually the hens do more good than harm. The natural food of the hens are the very insects which are most troublesome to us in the garden. One year I had a fine lettuce bed that was badly infested with cut-worms; but the hens soon found it out, for I let them run the most of the time. They went to work, and from appearances had soon destroyed it, and you wouldn't have given ten cents for an acre of it, after they had been on it for a little while. The cut-worms would come in the night and cut off the tops, then they would go under the surface of the soil; but the hens did not have to go very deep to get the worms. The lettuce came out all right, and I made some money out of it, whereas but for the hens I would have had no lettuce. There are some kinds of hens that I like better than others. Take the Leghorns and they will wander a good ways from the barn for their food. I don't think the Brahmas are quite as bad to scratch as some, but if they do get at it they are apt to break down the plants a good deal worse than others.

ENTOMOLOGIST.

Mr. Harris. I would like to speak of a matter of interest to the society. Last night we accepted the resignation of R. J. Mendenhall, as entomologist of this society. We have no provision in this State for the appointment of a State entomologist. Insects are doing an immense amount of damage, a little here and a little there, and their numbers are rapidly increasing. It strikes me that it is high time that we should petition, and, if we cannot do that, we should get on our knees to these solons and beg of them to secure the services of an entomologist who shall divide his time in the study of the habits of insects, and in experiments for their extermination. He should impart information for the benefit of every farmer, and there should be provision for annual and semi-annual reports, and they should be sent broadcast, as well as to have this information published in the newspapers. I want something more done than to publish such

information in the newspapers; I don't believe that more than one out of four of our farmers take an agricultural newspaper, and many of those who do read them, do not stop to consider what they read, marking the particular points and filing the paper away for future reference.

At the meeting of the Hennepin County Horticultural Society last Saturday, a committee was appointed to confer with a like committee of the State Horticultural Society, to ask the legislature to provide for an entomologist and mycoscopist. We need a man to examine these fungus growths and one who can tell us whether it was a bug that hurt those grapes. I don't suppose what information he would obtain in his researches would cost to exceed \$5,000. I presume the State can make the necessary provisions for obtaining the desired information at a cost not exceeding \$1,000. We have a State university and we have a Geologist. It seems to me the State might provide that in making the surveys throughout the State, there should be something done to get a practical entomologist. I hope that some steps may be taken to secure some action at the hands of the present legislature. I leave the subject with you.

President Smith then called upon Mr. J. E. Northrup, of Minneapolis, to read a paper which he had prepared upon the subject of "Seeds."

The following is the paper of Mr. Northrup.

SEEDS.

Mr. President and Gentlemen of the Society:

The subject of seeds is an all important one, and of more than passing interest to us all. The whole human family enjoys the benefits arising in varied forms from the seed, which sown to-day to-morrow affords us food, supplies us with clothing, and delights our senses.

The subject, then, if of interest to us, is especially important when considered in the presence of an assemblage which has for its object the gathering and disseminating of knowledge concerning the vegetable kingdom.

Were I to approach the subject from your grounds, I should feel extreme diffidence in giving expression to any ideas I might entertain to men whose lives have been passed in the study of the growth and habits of plant life, and from the anxious planting of the seed to its full fruition.

But every man to his trade and the few thoughts I shall present shall be from the standpoint of a seedsman.

We all concede the great importance of good seeds, and we all appreciate the disappointment which often results in not getting them.

In purchasing an article of clothing we can examine its texture and satisfy ourselves as to its quality, and there are tests, which will determine the value of any article of merchandise except seeds for which the only test is that of time.

This very fact has attracted to the seed trade many unworthy men who take advantage, not only of the facilities which are thus offered for deception, but find ready excuses for the failure of their seeds, in the circumstances of "injudicious planting and cultivation, unfavorable weather attending their growth," etc.

You have all, no doubt, experienced the sensation which attends the loss of a crop, after a season of labor and anxiety, and the seedsman from whom you procured the seed comes in for his full share of your maledictions.

If, however, there are "pirates" in the seed trade, there are also many conscientious, painstaking men to whom you are indebted for new and improved varieties, and who pursue their calling, fully realizing the responsibilities which rest upon them, and faithfully striving to meet them. And when your seed proves good and true, and turns you an abundant crop, should it not be as pleasant a duty to make known to him that fact as it is to inform him when the contrary is the case.

But a small portion of the seed-purchasing public realize the labor, care and expense involved in the production of a new variety of vegetable seed and the fixing of its habits.

As new varieties are the result of selection or hybridization, the tendency is to run back to the original stock—to retrograde instead of advance.

This requires constant watchfulness on the part of the grower. Discretion must be used as to the ground on which the seed is sown, care being taken not to put it in soil that will force too rank a growth. All noxious growths must be eradicated at the proper time in order to preserve the standard of purity.

Take, for example, an extra early pea. It must be early so that the gardener can market his crop while prices rule high. It must be even in growth and maturity, so that he may strip the vines at from one to two pickings, thereby saving expense and enabling him to use the land for other purposes.

In order to produce these results the grower must first choose good seed and put it on land that is strong, early and level. Level so that the crop will ripen off evenly, for if sown on uneven land the seed on the ridges will be early while that in the hollows will be later, and the vines forced to uneven and impure growths. Soon runners or rogues will appear and these must be carefully removed. The crop must be harvested at the proper time to secure the juices in the seed and a desirable sample.

As in peas, so in every variety of seeds. Each is made the study of some specialist who aims to produce it in its highest perfection. In fact, the conscientious seed-grower, to achieve the best results, must exercise over his stocks the same watchful care that a mother gives her child.

The seed-producing interests of the country have attained enormous proportions, and with its growth in bulk have increased the number of varieties, so that now we have thousands of so called varieties of vegetable seed.

Wonderful improvements have also taken place during the past few years in the quality of vegetables now grown. Many here doubtless remember well when the Marrowfat pea, now thrown aside as comparatively useless for the table, was the best pea known. What a revelation in this important vegetable was brought about by Dr. Fairbeard's accidental finding of a Champion of England in a pod of Marrowfat some thirty-five years ago.

Now we have at least two hundred so-called varieties of peas, some of them of distinctive character and merit, while others are comparatively worthless, or an old type put upon the market under a new name.

It would seem that amongst the number of varieties of real merit that the public appetite for novelties would be appeased. But so strong is the cry for something new and something better, something earlier or something later, that there are parties who make their sole business that of propagating new varieties of peas and disposing of the stock to seedsmen at figures that, to an outsider, would seem incredible. Fifteen hundred dollars per bushel would seem a pretty good price for peas; and yet I once offered Mr. Thomas Saxton, of Bedford, England, at that rate per bushel for his stock of a certain new pea, and did not get them at that!

This appetite for new and better varieties has had two diverse results. It has served to awaken the grower to the passing de-

mands of the hour, and has caused him to strain every nerve to meet them. The result—many new and valuable acquisitions.

It has also proven a strong incentive to unprincipled seedsmen to take some old and half forgotten variety, re-christen it, invest it with the combined virtues of all vegetables, and by the liberal use of printers' ink, spread it broadcast over the land at a fancy price. I think, I may say that fully two-thirds of the novelties to-day listed in the catalogues of *leading* seedsmen are standard varieties slightly improved upon, perhaps, or old and worn out sorts *renamed*.

It seems also to be the aim of seedsmen (speaking as a class) whenever they get hold of a good thing to give it another name, so that their competitors will not know what it is, or for some other wily purpose.

Old varieties, too, which were yesterday considered good, are to-day thrown aside for something else. Still the seedsman receives calls for them and is obliged to keep them on his list. Thus we find Carter's First Crop, Daniel O'Rourke, Philadelphia Extra Early, Caractacus Early Frame, Early May, and Early Kent Peas, listed in the catalogue under different names and at different prices, and the chances are they came out of one bin, and while once good and valuable varieties, have lost their distinguishing characteristics through this process.

Peas have been taken throughout to illustrate the points touched upon, and the same facts apply to almost every specie of vegetable seeds, though, perhaps, not to so great an extent.

The evils resulting are apparent. Much confusion arises in regard to varieties. The purchaser sends his half-dollar for some novelty selected from the catalogue and finds that he has some old kind that takes him back in memory to his boyhood days.

The seedsman, in order to have a full list, issues a catalogue at an expense of thousands of dollars, which must in some way be paid for from the pocket of the purchaser.

What can be done to avoid these manifest and growing evils? Hon. Marshall P. Wilder and Dr. Sturtevant, of the New York Experimental Station are doing good work in this direction, but the real and only remedy lies in the hands of the purchaser and the seedsman.

Many seedsmen are driven to the resort from the fact that strong competition, the fight for business, and the public demand have reduced the prices on standard varieties to so low a point that they cannot make their expenses, and are obliged to depend largely upon the novelties they offer.

The cry of "cheap seeds," too, has driven a number of reputable seed houses into the same channel.

The man who buys seeds because they are cheap, gets what he buys almost invariably. A few years ago a large seed house was retailing turnip seed at a lower price than it could be purchased for on the market. Accident disclosed the fact that they were baking rape seed so that the grain would be destroyed, and mixing with it a homeopathic dose of turnip seed; and as the two looked exactly alike, and what came up proved turnip, the purchasers probably ascribed the failure of the balance to the unfavorable season, and kept right on buying his seed of the same house because he could get it cheap.

In walking through a large seed warehouse sometime since, I detected the odor of burning brimstone, and my curiosity was aroused as to what part brimstone could play in the fitting of seed for market. Making some pretext for visiting that portion of the building from whence the fumes proceeded, I came to some cucumber seed, which was being bleached to remove the yellow tint with which age had mellowed it. The tags on the bags indicated that it had been in that building over twenty years, and how much longer no one knows.

The moral is this: Encourage your seedsmen to make *quality* the first consideration by making it yours. Pay willingly a good price for your seed and thereby fix the responsibility upon the seedsman.

If you do otherwise the irresponsibility and blame are your own, and you help demoralize a trade of which the true basis should be *confidence* and *trust*, and which all should endeavor to sustain in its purity.

Mr. Underwood moved that a committee be appointed on legislation regarding the appointment of an entomologist, consisting of Messrs. Wyman Elliot, J. S. Harris, and J. T. Grimes.

Mr. Grimes asked to be excused from serving on the committee. He said that Mr. Elliot was acquainted with the members of the legislature and would look after the interests of Hennepin county, while Mr. Harris was acquainted in the southern part of the State. Ramsey County is the second county in representation and he would suggest President Smith as a proper man to be a member of that committee.

Mr. Underwood accepted the proposed amendment to his motion.

President Smith said he had not shunned any duty imposed upon him for the past sixteen years or more, and there was no member of the society who considered it more important than he to have an entomologist; but perhaps there were others who might have more influence with members of the legislature, as he was not a politician and not a good hand at log rolling.

The motion was put by Vice President Sias and carried.

The following communications were read:

MINNEAPOLIS, Minn., Jan. 19, 1885.

DEAR SIR: I regret that your card requesting me to furnish an article for the society was received so late that I am unable to accede to it. I am much interested in the work, and only lack of time deters me from sending something for the meeting. At the next meeting, if desired, I will do what I can.

Respectfully,

MRS. C. O. VAN CLEVE.

ROCHESTER, Minn., Jan. 19, 1885.

T. M. Smith:

DEAR SIR: Thanks for invitation to attend Horticultural Society. Should be glad to do so, but not having received notice before of its session and no program, have made other arrangements, so that time will be wholly occupied for the coming week. Hoping you will have a pleasant and profitable time,

I am yours with best wishes,

M. W. COOK.

REPORT OF GENERAL FRUIT COMMITTEE, ROCHESTER DISTRICT.

The apple crop for 1884 was reasonably good.

The fruit display at the Southern Minnesota fair of this city in September last surpassed all former exhibits. The many new seedlings brought out on that occasion are worthy of special mention, particularly those by J. W. Hart, known as the "Brett Seedlings." Wood of the latter seedlings on exhibition showed perfect hardiness. Also the Waldron seedlings were much admired. The following six varieties of apples, in the order named, are deemed worthy of cultivation for this locality: Wealthy, Duchess, Elgin Beauty, Tetofsky, Juicy Streaked, Red Anis. Hybrids—Whitney No. 20, Early Strawberry, Beach's Sweet.

The strawberry crop for 1884 was all that could be asked for. It is estimated that the crop marketed by growers in the vicinity of Rochester alone would not fall short of 3,000 bushels.

The varieties best adapted to this locality, so far as tested, are Crescent Seedling, Downer's Prolific, Boyden, Green Prolific, Old Iron Clad, and Piper's Seedling.

Raspberries. — A magnificent crop. From 2,500 to 3,000 quarts of this fruit were the daily shipments from this market during the best part of the season, principally of the Blackcap variety. Best varieties, so far as tested: Blackcaps: Ohio, Doolittle and Tyler. Reds: Turner, Cuthbert, and Brandywine.

Grapes. — Crop good. Our choice for this locality: Worden, Concord, Janesville, Moore's Early and Champion.

M. J. HOAG.

FRUIT REPORT FOR McLEOD COUNTY.

The culture of small fruits in this county has received considerable attention the past two years, and those giving them the necessary care have received their reward.

Our markets were pretty well supplied with strawberries the past season, and some currants and wild raspberries were in the markets. Wild plums were plenty.

Plenty of crab apples were in market. Perhaps half a crop was produced. There is generally a surplus of crab apples here which find a ready market in Dakota.

But few standard apples are grown here. What few find their way to market are mostly Wealthy and Duchess.

Most of the farmers have been swindled so many times that they will buy but few apple trees at present. They want something that is almost literally iron clad, trees that will stand the coldest of winters, the hottest and longest of droughts, browsing of cattle and rabbits at the top and gnawing of gophers at the bottom.

I think it a waste of time and money for the majority of our farmers to buy standard fruit trees.

If our farmers wish to have plenty of nice fruit they should invest a few dollars in the hardiest kinds of small fruit plants. Currants, gooseberries, grapes and strawberries hardly ever fail to produce a good crop if given proper care. The market demand for fruit seems to increase as fast as the supply, and I think the future will show a rapidly increasing interest in horticulture in this county.

M. CUTLER.

REPORT OF G. W. FULLER.

LITCHFIELD, MINN., JAN. 22, 1885.

T. M. Smith, Esq.:

DEAR SIR: Your card received, and would have been answered before but I have been away from home. I am sorry to say I can not give you very definite figures about our fruit and so will not give many.

Our Wealthys bore very full, so that we had to pick a good many when not half grown.

The crabs bore nearly as well; our Whitney No. 20 have not yet began to bear well. But the Tetofsky and Duchess only gave a fair crop.

Strawberries bore finely but as we dig plants from most of our beds, can not give figures.

The dry weather hurt our raspberries and currants so we only got a two-thirds crop.

The Cuthbert seemed to stand the dry weather better than others.

The long fall gave grapes a chance to ripen up well, and we gathered some fine ones, though we are not well situated for raising them. Yours truly. GEO. G. FULLER.

REPORT FROM J. C. KRAMER.

LA CRESCENT, MINN., Jan. 19, 1885.

T. M. Smith, St. Paul, Minn.:

SIR:—Your card received. I would say in regard to your wishes, that I am not able to send a full report upon fruits of this vicinity, but will try to do so to the best of my knowledge.

First, the apple crop has been a fair one but the fruit rather poor and wormy. The trees are dying out badly. I have lost almost all my apple trees; two Talman Sweet, two Russet, one Snow Apple. Duchess is sound; also the Tetofsky. I think we shall have to commence raising seedlings altogether. I have so far had good success with seedlings; have now ten trees in bearing. Some of them are very good. Have had more benefit from my seedlings than from all the trees I have ever bought. Have some nice samples on hand which I had intended to exhibit at the annual meeting, but the weather is such that I cannot come up. As soon as the weather will permit will send them to you

for examination, and trust you to give a report of them if you desire. Hope I will have some fruit from trees raised by my new method. As soon as they show their fruit I am ready to give a full report and a history of them. Think I shall have good success and that they will prove to be hardy trees.

Grapes are healthy at present, the wood being sound and ripe. The crop was small. Concord is so far the grape that seems to be best adapted to the climate of the Northwest. Have some new seedlings that have not been fairly tested. Have two new grapes of value, and will send a specimen of one kind. Am on track of some good seedling apples and will get hold of them if possible.

Strawberries.—The crop was light. My best so far is my seedling No. 2. It is late, good bearer, healthy, dark leaf, fruit dark; have counted twenty-seven berries on one stem. It is a pistillate berry. Have one newer variety, which I think will bear next season.

Raspberries.—Have three new red seedling raspberries, all distinct, or different from each other. One of them is a full type, that is, renews from the top; another is hard to produce plants from; both splendid bearers, rank growers, hardy enough for Siberia; the third is a sucker from the roots. I discovered it in 1883; last spring the ground was broken and I noticed about a dozen canes that came up, but I paid no attention to it until late in the fall, when we had some visitors. We were passing around showing the remarkable vines and leaves, which were three times as large as usual, and they were astonished to find fifty-three berries on one cane. The largest one measured one and one-eighth inches in diameter, or three and three-eighths inches in circumference, and I kept that berry for nine days in good condition. What the result will be with this kind I do not know; another season will tell.

Yours respectfully,

JOHN C. KRAMER.

DISCUSSION.

Mr. Harris. Mr. Kramer is always making experiments. He has been experimenting for years with raspberries and strawberries, and he is a wideawake man. He had a very fine raspberry on which he was experimenting but he would not give me any of the plants, and he used to watch me pretty close, afraid I would take the plants, I suppose. He has originated hundreds

of varieties of strawberries, but has only one variety that he says he has any hopes of, and I have no idea that that is any better than some other varieties that we have. I believe that he is entirely honest.

Mr. Smith. Would it not be pretty hard to beat that raspberry?

Mr. Harris. We found one variety in his grounds that would beat it; it was a rather remarkable variety, and we found one berry that measured over six inches.

Mr. Whipple. Do you mean in diameter? (Laughter.)

Mr. Harris. I mean in circumference. I tried to get some of that variety of plants; I offered him a dollar a plant in order to get started with it. But he declined to let me have them. The next year his sheep ran in there for a pasture and the plants were destroyed. He is that kind of a man, all the time planting and experimenting.

On motion of Mr. Underwood the report was ordered published.

Gen. Le Duc related an amusing anecdote of a colored preacher who, after being poorly supported by his congregation for a number of years, told them he would take his text where he would find them: "Where the hen scratches, there she expects to find the bug." (Laughter.) He said he would like to find out from the lady who had read the interesting paper about the fowls, how she proposed to make any money out of them? He wanted to ask some questions and have a little discussion before adjournment.

On motion of Mr. Smith the rest of the evening was devoted to discussion.

DISCUSSION ON INSECTS.

Mr. Underwood. I would like to inquire as to the best methods of killing the codling moth and curculio, which infest the orchards, and which produce the little worms that are doing so much mischief. I have seen numerous articles in different horticultural works as to the best methods, and think the one that seems to have preference at present is that of spraying the trees.

Gen. Le Duc. I have seen that done. They make an emulsion of kerosene and some other article which they use, known as London purple, but I think they have abandoned the use of the London purple, and use a preparation of arsenic. The trees that are expected to bear fruit are sprayed regularly. It is done

in a very short time and at little expense. A man takes a barrel filled with the composition, and has a pumping apparatus, and drives through the orchard with a stone boat, driving between the rows and stops by the trees, and the spraying is done by means of a hose. The man who drives the team works the pump, and the trees are sprayed very rapidly. It is cheap and effectual. There is no trouble with the insects. In the South, where I have seen this done they treat other fruit in this way, their orange trees, lemons, apricots, and peaches, and I have also seen it applied to olive trees and English walnuts. Generally the walnut takes care of itself. I think the cheapest thing for an emulsion is kerosene oil. You will find a description of the process in the report of the Department of Agriculture for the years 1880 and 1881, and you can find it also in the *Rural New Yorker*.

Mr. Gideon. Do they put anything in with the kerosene?

Gen. Le Duc. They put in milk.

President Smith. They also put in soapsuds.

Mr. Whipple. I have tried an experiment. I saw a plan recommended in a leading agricultural paper for killing the curculio; I told my wife I would test that. It was to take a white sheet and spread under your plum trees and go along at the proper time and jar the trees and the curculio will fall and lie dormant until you could take them off and burn them. So I went out with a sheet and labored faithfully for an hour or until I got hungry; it worked well. I succeeded in capturing one of the bugs, and I came in and told my wife that I was satisfied that would work. (Laughter.)

Gen. Le Duc. I have captured hundreds of them in that way.

Mr. Smith. I would inquire if the larvæ does not have to go into the ground before it changes?

Mr. Harris. Not necessarily. The codling moth don't go into the ground. They will change their form under the hoops of an apple barrel, or you will find them in your pantry if you have apples there.

Mr. Underwood. I would like to ask Mr. Harris if these screens which he recommends for the protection of trees ought not to be taken off in the spring of the year, for fear they might furnish a hiding place for the codling moth, or other insects?

Mr. Harris. My impression is they ought to be taken off. They will hide there. The codling moth won't get under, but

after the first crop of apples drops that have been stung, the worm will crawl up and where they touch the tree they find a harbor and the insect is protected and the birds cannot get at them. It would be well to examine them and to kill all the worms you may find.

Mr. Smith. Is not a band of hay a good protector?

Mr. Harris. If you will destroy it.

Mr. Smith. And again, wouldn't it work well to have the chickens run through the orchard and especially about the time the first crop is harvested?

Gen. Le Duc. I have relied upon chickens to defend my plums and they did it thoroughly this year. I put a brood of chickens under the tree and I had a fine crop of plums. I would like to inquire of Mrs. Underwood as to her theory about the shading of trees; when do you put around your screen and how long do you keep it there? Do you think the sun injures the tree in mid-winter, or when the sap starts in the spring?

Mrs. Underwood. I cannot tell much as to the results as I only put the shield on this winter. My theory is that the sun scalds the bark of the tree during the winter. I think it is mainly when we have these sudden changes during the warm, thawing spells.

Mr. Underwood. I think that has been canvassed in our society almost every winter. We have illustrations of it in the forests. You have noticed, perhaps, that when you go outside the house, right under the porch, where the wind could not get to it and the sun was shining, the snow was melting. I have seen it but I could not say positively how cold it was but I know it was very cold, and I think the uneven temperature, caused by the direct rays of the sun, just at the warmest time of the day, is undoubtedly the cause of this injury which is done on that side of the tree.

Gen. Le Duc. I could understand how that could be the case if there was any sap in circulation.

Mr. Underwood. I built a fire one time in the spring of the year near to an oak tree. I was not thinking of injuring the body of the tree, but thought I would try and not injure the top of the tree. It was a thrifty, live young oak, as thrifty as I have ever seen, and you will imagine my surprise when in ten or fifteen minutes the bark cracked from the root up as much as six feet. I am not much on theory but I can tell what the result is. So with our apple trees, we find on the south side where the rays

of the sun are directed from 12 to 2 o'clock in the afternoon the injury is done, and there is everything to indicate that it is done by the rays of the sun. It is not done in the summer time, that is sure; I think it is done in the severe cold weather. Most likely in February and March. It is possible this matter of protecting our trees has not engrossed our attention as it should have done. It is one thing that we shall attend to more closely from this time forward. I hope I will have sense enough to protect the outside of the tree. The chicken plan is all right where it can be carried out, but of course with some 30 acres of orchard to protect from the codling moth and curculio it would take a good many chickens.

Mr. Gideon. I have had some experience and examined into this sunscald to quite an extent. I have not yet seen a sunscald on any portion of a tree where it was shaded during the heat of summer. My theory is that it is done by the hottest weather in the summer. It seems to me if done in the winter various portions of the tree would be sunscalded. An open top tree it never shows, except on that side of the tree where the sun can not strike it when the leaves are on. If it was done after the leaves were off we would see where it would strike through and attack large branches on the opposite side; when the leaves were off the sun could shine through. I don't think the sun ever effects a tree after the leaves are off from that time until the hot weather comes again.

Mr. Tuttle. I can indorse what Mr. Gideon says in regard to that injury to the tree. I have watched that thing a great deal, and if I were going to protect the tree at all (and it is very desirable that a tree should be protected while the buds are drawn up as they should be) I should protect them in the summer. It is the strong heat of the summer in the warmest part of the day which strikes the body of the tree. This work is not all done in one season, but it is work that is going on for years. You will find where the foliage of the tree does not shade the body, the tree flattens, the growth is obstructed, and gradually the bark becomes hardened and injured. Then we will have a severe, cold winter, in which the injury will show itself by the rupture of the bark. The cold acts exactly in the same way as the heat, to drive out every particle of moisture from the tree upon that side where the injury has been done in the summer. The difficulty is frequently finished up in the winter. I know in the Southern states—in Georgia and Alabama—they have to put boards up on

the south side to protect the trees in the summer. I believe if our trees were protected in the summer there would be no danger from bark bursting. I had trees called the Summer Golden Sweet. The body of the tree stood so that in the hottest part of the day the rays of the sun were direct upon it. I noticed this hardening process going on for a year or two, and in the fore part of the summer I saw the leaves were turning yellow. I went and put up some siding to protect the body of the tree, and it lived for twenty years after that. I left it there summer and winter. The bark became loosened, and it grew over. The tree finally got healthy on that side; and I have no question in my own mind that the cause of the injury in the first instance was in consequence of the extreme heat of the sun in the summer. I have trees nearly a foot in diameter, with large limbs, which lay under the direct rays of the sun; and I think they would be injured if that was the cause of the trouble, for the bark is more tender than on the body of the tree. Again, it is seen that in the summer that portion of the tree that is not shaded by the foliage will be injured, and those portions that are shaded always escape.

In regard to this use of the London purple for the codling moth, or the use of arsenic, I don't see how you can reach them. This moth works in the night, and stings the apple during its early formation; and how are you to reach the codling moth with poison when it merely stings the apple? We don't know that the moth eats anything. Anything that eats the arsenic or London purple, it will destroy it.

Gen. Le Duc. Or anything that hides in the bark.

Mr. Tuttle. The moth operates in the night. It is a sure and certain remedy for anything that feeds upon the leaf.

Mr. Underwood. I would ask Gen. Le Duc how the kerosene works?

Gen. Le Duc. It affects those insects that destroy the tree. My earliest experience with it was in 1856. I bought the first barrel of kerosene that came here for lighting and for oiling purposes. I took it to Hastings to use in a mill for oiling purposes. I had some plum trees. I requested one of the men to bring over some turpentine, and instead of that he brought a can of kerosene. I tried some of the kerosene, and found that wherever it touched one of those insects it doubled up and was dead in a moment. So, instead of sending it back I used the kerosene and destroyed all the insects there were there. I experimented with other insects. This was distilled kerosene, of the cannel-coal, or

from some of the shades, but was, in constitution, about the same as it is now. I wrote an article to the *New York Tribune*, explaining the destruction which it was to insects in this use of kerosene. About two or three weeks afterwards I noticed some of the limbs where I had applied the kerosene oil, and found it had killed them and destroyed that part of the tree where I had used the kerosene. I didn't like that part, but I thought those who tried it would find it out for themselves. Kerosene oil is as destructive as anything I know of for all insect life, as much so as anything except the London purple. This dust is sold very cheaply, and is prepared by the druggists, and is worth perhaps 75 cents an ounce. You can reach with it millions of insects that fly, that you cannot reach in any other way. I have destroyed the troublesome millers with it that are so fond of cabbage.

Mr. Gideon. Is it a poison?

Gen. Le Duc. Not to animals. It is to insects. It brings on convulsions. It is not poisonous to human beings. I use it in my stable frequently where it proves very effectual.

Mr. Gideon. In using kerosene, what proportion of water would you use?

Gen. Le Duc. You want to use kerosene with milk and mix with water. You want to make an emulsion and apply with a syringe. We used it altogether in protecting the greenhouses in Washington and were very successful. That was done with water, but it led to experiments which resulted in the emulsion.

Mr. Tuttle. I would say that that same remedy had been used on the cranberry marshes for the worm. They used I think some seventy-five barrels of kerosene on our marsh for the vine worm this last season. I am satisfied that for anything that eats the leaves as the vine worm does, I can destroy with ten cents worth of arsenic as many insects as you can with a barrel of kerosene. That amount of arsenic is enough for three barrels of kerosene, and sufficient in strength to do thorough work.

Mr. Whipple. Would you recommend the use of that on cabbage?

Mr. Tuttle. Well, no; I don't know as I would. In regard to the codling moth I would say, that I have tried a great many remedies, and I have destroyed more codling moths in a single evening with a pan of vinegar than with any other trap I have used. I have set out a six quart pan filled with vinegar and the next morning have found it covered.

Gen. Le Duc. Is it possible?

Mr. Tuttle. They will be attracted by the vinegar. They will collect where there are sour apples. The first I noticed it was by their getting into a large cask of vinegar holding some eight or ten barrels which I had standing out of doors. I thought it very good use to make of it as it was the best trap I could get for the codling moth.

Mr. Dartt. Mr. President, I wish to say that I have good reason to believe that this injury to the trees that has been spoken of is done during the latter part of the winter by the effects of the sun. I will not take time to give you my reasons. I have had experience with the plum trees in the hen yard. There may be hens that have kept everything from growing under the trees, while nearly every plum was stung so that it was good for nothing; but I am inclined to think that theory is a humbug. It has proved so with me and I think that this new branch of horticulture that has been brought out to-night is the most profitable branch; and all will admit that it is the most profitable of any that we have had in our society and that there is more money in raising "hen" fruit than any other kind of fruit that we can raise. (Laughter.)

Prof. Henry. Mr. President, I do not want to see members leave until the fog is cleared up on one point. In regard to the codling moth, I want to say this: You can carry your mind back to the time when the tree is in blossom and at the time when the blossoms fall from the petals; at that time, during a couple of days the codling moth is around depositing her eggs. She deposits her egg near the calix end of the blow, and if left there twenty-four hours, it hatches into a worm. Now, having them located in that place, the question is, how can we manage to kill that little fellow? The best thing to do it is to use some of the arsenical preparations. If you have insects destroying the leaves, you want to get the arsenic upon the leaves where it will be eaten. You will not kill the vermin until the arsenic is eaten, and if the rain washes it off, then you must apply it again. And so with the destruction of the young larvæ upon the apple buds; you can apply the arsenical preparation by means of a force pump, and leave it on the bud of the apple until the worm has eaten some of it. You do not hurt the female. I don't know that she eats anything. But if you will follow out this idea you cannot help making your work effectual. But you must remember that the rain will wash off the arsenic and then it needs to be re-applied.

One other point. In regard to the splitting of the oak tree,

referred to by Mr. Underwood. It struck me at once as illustrating an interesting fact in regard to the sap. In the winter the sap does not travel up and down the tree like it would in a stream, for it cannot come from the roots in cold weather. There is in a maple tree a large amount of sap and a considerable quantity of air. During a cold night the air passes in and out of the tree, for you know that air will pass right through a tree, but of course it is very slowly. There is a certain quantity of sap there and air within the cells. When the bright sun comes out, the heat striking the tree expands the air, that squeezes the sap in all directions. If you tap the tree the sap flows out; that is the theory of the flow of sap in the spring. Had the fire been built up very slowly, the tree would have been heated slowly and the air would have gradually passed out and that phenomenon would not have been noticed.

Mr. Underwood. I don't see how that would affect the tree in that way in the winter.

Mr. Pearce. I would like to say one word on that subject. I am glad the professor is here, so if I am wrong he can correct me. I take a different view of this injury to the tree from all others pretty much, but science has to bring out these points; theory is not going to do it. It is a well known fact that during the winter time the roots are inactive, but there is life in the tree. In the spring of the year the buds begin to start, through the aid of the carbon in the air, and that produces sugar and glucose and other substances necessary to produce the bud. Under the bark of the tree the sap cells are supplied with food, which during the coldest days of winter, is passing off through the pores of the tree to the outside. There is food in the tree passing off all the time. If the winter is very long and the supply is very scant this food become entirely exhausted. I have investigated this with a microscope that magnified two or three hundred diameters. When the food in the tree becomes exhausted, I find the bark dies and becomes dried up. As long as there was this nourishment it kept the bark alive and kept it healthy; but just the moment all the food in the bark passed out, there was nothing to keep up the freshness and vigor of that bark. We see this illustrated with the southern trees, where they have shorter winters, and of course there it requires less food to carry them through. There is food enough to last two or three months. But here we find sometimes that there is not enough food in the trees to carry them through, and they become exhausted some-

time during the month of March and die. I will go farther and say that there is a great difference in the bark of trees; there is a great difference in the cell tissue; some trees throw off less moisture than others. Take the Russians for an example. As a general rule, the naturalist will distinguish the difference in trees that grow in one country and those that grow in a warmer country. The cell structure is different as well as the covering of the bark. Everything is made to close and keep this moisture in. But if this food becomes exhausted the tree dies. When we examine the Russian varieties, we find a different class of trees altogether. We find thicker bark, the cells are covered and calculated to go through a long winter. My remedy for this difficulty is to keep my trees growing and give them all the nourishment I can. After the terminal bud is formed then comes the process of filling up the sap cells; then evaporation commences and keeps on, and I doubt whether there is any sap in solution in the tree in the winter. It passes off and is all assimilated, and the tree goes into the winter in a condition so that it will not rupture. In my orchard I aim to have my trees in good condition in the fall. I want the buds all out full, and want the bark smooth, not all shrunken in.

Gen. Le Duc. How are you going to make it that way?

Mr. Pearce. I feed my trees.

Mr. Whipple. Have you accomplished the object?

Mr. Pearce. I have with some trees. Every tree that I have taken care of and mulched has done well; but I may be all wrong.

Mr. Gideon. I think you are getting off on to science.

Mr. Smith. I had some experience which I would like to relate. I had a few rows of grafts, Red Astrachan, Duchess, Perry Russet and Transcendents. On the west and south side were a lot of grapevines. The trees were all in a good healthy condition, to all appearances, on the first of December. The snow drifted over the grapevines until it was something like three feet deep and came to the tops of the trees. Toward the north end the snow was all blown off the ground. I noticed that along in February the ends of those trees looked dry and too dark-colored to be healthy; I cut some of them off and I noticed that they showed a dark color between the wood and the bark. In the spring when the snow was all off, those at the south end that had been buried in the snowdrift, started to grow as high up as the snow was on them; toward the north end of the rows

they were all more or less affected, and on the south side of the trees the bark cracked and peeled off. Some of the Transcendents blistered and cracked their bark, and yet, in that condition, formed a new bark over that and grew all right. The most of them I cut down to the ground the next spring. I believed at that time that all of the damage was done between the first of December and the first of April. When I examined them the first of December they appeared to be all right, and I noticed this trouble along about the first of February; but noticed it more particularly about the first of April. The Red Astrachan, which was buried in the snow, started out without any bark blistering at all.

Mr. Pearce. I would like to ask the opinion of the professor about this phenomena of the sap and the cells of the trees.

Prof. Henry. It would take too long to go into that at this time.

Gen. Le Duc. I would ask if, in using the arsenic to destroy the colding moth, the eggs are not deposited too deep to kill the insects in that way?

Prof. Henry. No, sir; it is on the surface. By spraying the tree it will catch them. The arsenic preparation is fatal when eaten. It kills the worm and in some instances will kill the eggs also. But, recollect that if you use the arsenic preparation you must use it before the little worm has got into the apple, for when he has gotten inside the little apple he is safe, and he laughs at you. You must catch him after the egg has been laid and about the time the petals fall from the blossoms.

Gen. Le Duc. The simplest thing is the vinegar.

Mr. Underwood. This has been to me the most interesting and profitable discussion of the session thus far. I hope we may get a paper from Prof. Henry elucidating these matters more fully than he has been able to do here to-night and trust we may not be disappointed. I want to say in regard to the injury to that oak tree from the bark bursting that I cannot get it out of my mind, that it is not the freezing but the sudden thawing that does the damage. As the Irishman said, "It didn't hurt him at all to fall off the house; it was the stopping." So I think that when the sun comes out and warms up the south side of the tree that that is the time when the injury is done. Of course I am dealing with these things in a practical way, not in a scientific way at least; and it is very pleasant to have someone who has given these things more thought and who is able to

help me out on the scientific part of it. I shall try and profit by all this discussion that we have had. It seems to me that the most profitable and the most to our interest is the protection of our trees from the ravages of the curculio and the codling moth, and information of this character is the most important and valuable we can obtain.

Mr. Dartt. Mr. Underwood is right.

Mr. Shannon. There seems to be a difference of opinion as to the proper time to protect the tree.

Mr. Underwood. It seems to me the protecting of the tree by means of a board is apt to make a harbor for the worms.

Mr. Harris stated that it was getting late and was past the usual hour of adjournment, but he hoped there would be a good attendance in the morning to listen to the discussion as to the location of State fair grounds. The meeting then adjourned till morning.

MORNING SESSION.

THIRD DAY—THURSDAY, JANUARY 22, 1885.

The meeting was called to order by President Smith at 9 o'clock.

FRUIT REPORT FROM J. W. POOL.

FARMINGTON, Minn., January 21, 1885.

T. M. Smith, President State Horticultural Society.

We have had one of the best years for all kinds of fruits I ever saw in the state; with me especially all kinds of small fruits. Strawberries we had in abundance for four weeks; grapes, also, were a good crop with me.

JAMES W. POOL.

LETTER FROM F. G. GOULD.

A letter was read from F. G. Gould, from New Orleans, stating that fifteen entries of grapes had been made at the exposition in the society's name, comprising eleven varieties displayed on sixty plates, and he thought they had won three medals and

seven prizes. Of the ten plates of the best, five of each were for the table and wine. The best plates contained the Concord, Delaware, Catawba, Ionia and Brighton, and best bunch. Ohio gave Minnesota the hardest pull on the Catawba of any state east of the Rocky Mountains. Rev. C. B. Sheldon, of Excelsior, was more than a match with his Catawbas for the Lake Erie district. A. Bonjour exhibited the best bunch of grapes; A. W. Latham the best Concords, and F. G. Gould the best Delawares.

Mr. Dartt was requested to present his report as delegate to the meeting of the Iowa State Horticultural Society.

REPORT OF E. H. S. DARTT, DELEGATE TO IOWA.

Mr. President and Members:

I have again been privileged to attend the annual meeting of the Iowa State Horticultural Society. The meeting was well attended by substantial, representative men of one of the best and most progressive states in the Union. Delegates were in attendance from Wisconsin, Illinois, and Kansas, to whom were extended the usual courtesies.

The last year has been a very disastrous one to the fruit interests of Iowa. The reports of directors from all sections except the southwestern portion show a light crop of fruit of nearly all kinds, varying usually from half a crop to a total failure. These valuable reports also show widespread destruction of trees in orchards, twenty-five to thirty per cent of all orchard trees being killed outright or virtually ruined. It may be regarded as a singular fact that this destruction was greatest in the southeast part of the State, where the mercury went down to about forty degrees below, and seventy-five per cent of orchard trees are reported ruined, some entire orchards being destroyed on low lands, while on high lands the injury was proportionally less according to altitude.

The greater destruction in this section is undoubtedly due to the fact that farther north more attention has been paid to the selection of hardy varieties. Nursery stock and young orchards have suffered but little, while orchards ten to fifteen years out are injured worse than older trees. The variety that has suffered worst of all is Ben Davis. Some will replant this variety on account of its good record in the past, while others will discard it entirely. In the southwestern portion of the State but little injury was done; a few trees were killed, the number increasing toward the north.

The fruit crop in this section was generally good.

There seems to be quite a difference of opinion as to the cause of this general destruction of trees. Some believe it is not the severe cold of winter that kills, but the sudden changes towards spring. Others think the condition of the soil as to moisture at the setting in of winter has an important bearing — abundance of moisture being a favorable condition. But all agree that hardier trees are a necessity, and that to obtain long keepers of the best quality extensive experiments must be carried on, and in view of this fact they voted to ask for an annual appropriation of \$2,500 in addition to the \$1,000 they now receive, believing that a state rich enough to build a \$2,000,000 capitol can well afford to devote this small sum to promote so important and reliable a branch of industry.

The president's address was brim full of good, practical suggestions, and the lectures and essays were admirable productions in the English language, affording scarcely a reminder that the authors knew a little Latin and desired to make the most of it.

It occurs to me that in sending delegates to adjoining states more favorably located than our own, our greatest benefits must accrue from adopting such of their methods as are superior to our own and avoiding such as retard.

In my last report I mentioned Iowa's plan of districting the state and electing a director from each district. My observations at this meeting confirm me in the opinion that with the combining of the reports of two or three of twelve districts in one to save repetition, as recommended by their president in his address, we may adopt this plan with great advantage to the whole State, and we might be relieved from the charge of being too local, and of being under the control of one of those little rings that frequently cluster around state capitols.

The program seemed remarkably full, requiring the constant effort of their able and energetic president to put things through on time. Fruit lists were revised by committees, and when reported it was announced that there was no time for discussion. If it is a fact that fruit-men, like others, have their whims, hobbies and errors, and that these are likely to crop out in their essays, it would seem that time should be secured to discuss all papers to the end that nothing shall go on record with the seeming approval of the society that is not in accordance with the views of the majority. On important questions where there is a radical difference of opinion, a recorded vote, showing the number on

each side is more reliable data for the guidance of the people than to leave them to judge by reading the remarks of individuals. For it is a melancholy fact that some men, the world over, have vastly more lip than sense. Their mouths are always open, and they talk so much that those more modest are ashamed to say anything. But if we take a vote we get the views of the wiser heads who think more and talk less; and besides we make a record that may save the necessity of fighting the same battle o'er and o'er year after year. If we can thus establish a few landmarks, even though we might have to right up the lines the next year, it will secure more substantial progress than to stick no stakes and attempt a new survey of the entire field each year.

Good generalship is, perhaps, as essential in running a horticultural meeting as in managing a farm; and a farmer who plans twice the amount of work he is able to perform is unwise, and if in addition to this he indulges in story-telling in the field, all the worse. With a program just broad enough to cover essential points thoroughly discussed under a five minute rule, to hold in check our nice talkers, who frequently edify more than they instruct, and a clear and succinct record of these discussions, we may reasonably hope to bestow upon the people of our state those benefits which they have a right to require at our hands.

On motion of Mr. Harris it was ordered that the report be embodied in the transactions.

Mr. Pearee called up the matter of the prize essays which had been offered at the meeting last year, and a discussion was had as to the manner in which the committee had made the award. The discussion was at some length and quite animated; but pending action the matter was laid upon the table.

ANNUAL REPORT OF THE SECRETARY OF THE STATE HORTICULTURAL SOCIETY.

NEW ORLEANS, La., Jan. 12, 1885.

Mr. President and Members of the Society:

My duties as commissioner to represent Minnesota at the World's Industrial and Cotton Centennial Exposition at New Orleans have prevented me from giving that constant personal attention to the horticultural interests of the State which heretofore, since I have acted as secretary of our society, it has been

my pleasure to bestow. Yet so far as the actual duties of the secretaryship are concerned in the usual routine work, nothing that I am aware of has been neglected. The annual report for 1884 was out of press and mailed to members on the tenth of April, an earlier publication than ever before secured; due partly to the prompt attention to the printing and binding by the State printers, Johnson, Smith & Harrison, of Minneapolis, and partly to the fact that from the day of adjournment of our last annual meeting, to the tenth of April, I was enabled to make daily visits to Minneapolis to read proof at the printing office, without the usual delay of sending and returning the proof by mail.

You will observe by my account, herewith appended, that some extra expense attended this attempt at an early publication, but having succeeded, for the first time in the history of the society, in placing the report in the hands of the members before the season of spring planting came upon them, it seems to me that the expense was well invested.

The reports have been distributed to all persons entitled to them by law. They have been sent to the members of the State Senate and I have requested the librarian to send to the capitol a sufficient number of copies to supply the members of the House of Representatives. Under the instructions of the society at the annual meeting two years ago, I have mailed our reports to all persons making application for them.

Our reports are in demand from citizens of all the Northwestern states and many others. Whether it is to the advantage of the State to continue this free distribution, it is not for me to say. The record shows that large numbers of the citizens of our own State are receiving copies of the report, upon application by mail and otherwise, who are not contributing as members of our society. While we continue to have enough copies to supply people who care enough to read our reports and ask for them, it seems to me better to send them out than to put away an unnecessary number of copies to remain unread in the library.

I have not been able during the year to look up, as formerly, the new varieties of apples reported from various parts of the State, but trust you will get some accounts of them through our committees and members to extend the record of this interesting class of our fruits at the present meeting.

The cions sent out for trial are all recorded in the last annual report and I hope the members who had them will furnish a statement as to the varieties living and how they are doing.

The year of 1884 has been in some parts of the State very favorable to the apple crop. We have had no difficulty in obtaining large quantities of excellent specimens of the "Wealthy" and enough of the sorts, in more general bearing, to be able to show at the World's Exposition nearly two hundred bushels in all. I have not found a larger quantity, nor finer specimens of apples in the exhibits here of any State, although some of them exceed us in number of varieties. At the present writing we are just laying out our fruit for exhibition and find most of the fruit, except the grapes, in excellent condition. The attempt to show our grapes has been an experiment and is not an entire success.

The proceedings of the summer meeting have been copied out in proper form for publication and are herewith submitted. These proceedings with this brief statement and the financial account appended, I must ask the society to accept as my report to the annual meeting.

I hope you may find in the horticultural results of my work as commissioner some compensation for my shortcomings as secretary.

If the society should think it best to get out an annual report for 1885, it is my duty to recommend that some other person be selected as secretary for the coming year, as my duties in maintaining the exhibits of the State at the World's Exposition and attending to their proper representation, and preparing the official report at the close of the Exposition will place it out of my power to edit and publish such an annual report for the current year as I would be glad to get out as one of the series with which I have been officially connected.

I trust that you may have a pleasant annual meeting, and enlist more of that appreciation and support from members of the legislature and the State officers which have been heretofore accorded us; and that although your secretary is away among the orange groves, you will believe that his interest in the problems of fruit growing in our State has not abated.

I will send a check for the balance due the society, to my successor, as soon as I hear of his election.

Offering the members and their friends a cordial welcome to the Minnesota Department of the Exposition, should they find themselves in New Orleans this winter or the coming spring, I am,

Yours respectfully,

OLIVER GIBBS, Jr., Secretary.

P. S.—*I will hold the proceedings of the summer meeting and send to the new secretary.

*Proceedings not received.—Sec'y.

UNION FAIR GROUNDS.

President Smith here called attention to the fact that there were present representatives of the Minneapolis Board of Trade and of the St. Paul Chamber of Commerce, to consider the proposition for Union Fair Grounds, etc., between the two cities.

Remarks were made by Hon. C. M. Loring and Hon. Wm. S. King, in behalf of the proposition of locating a park and fair grounds at or near Minnehaha. Capt. Russell Blakeley and D. W. Ingersoll spoke of the proposition to locate grounds for a fair and other purposes near the Union Stock Yards. It was not deemed advisable to take any action whatever in the matter; and the president stated, at the conclusion of the remarks, that the regular order of business would now be proceeded with.

Mr. Elliot moved that a committee be appointed to wait upon members of the legislature in session in the capital building, and invite them to view the exhibit of the Society.

Mr. Dartt objected to taking up time with outside matters which should be devoted to the regular order of business.

President Smith stated that the legislature had given the society a liberal appropriation, and it was expected that further appropriations would be asked for; and it was proper that the members of the legislature have an opportunity to see what the society is doing, and what it proposes to do. The motion was carried.

The chair appointed as the members of the proposed committee Messrs. Capt. Blakeley and Col. J. H. Stevens.

Mr. Dartt said that while the committee were performing the duty assigned them he would like to read a short article taken from the *New York Tribune*: "This is the time of the year when farmers' societies meet. Members go long distances to attend the meeting, leaving their work and expending hard-earned money to what end? To get the benefit of the experience of others and communicate their own. Each member has been working for a season in a different locality. If he stays at home he does not profit from the counsel of others, and others lose the results of experiments. I regard the discussions in which the members take part as the most valuable part of such meetings. More than half the papers might, with profit, be left unread. Many of them are of great value; but usually a member will consume half an hour or an hour when he should occupy less than five minutes; and his remarks would be far more convincing if

to the point than the advancement of mere theories. In horticultural meetings the prominent feature should be to furnish popular and interesting discussions. Every fruit grower desires to hear from the men who live in the orchards and berry fields. They desire to communicate their own views also. It is the same with agricultural journals."

Mr. Pearce offered the following resolution:

From the fact that knowledge is power and the growing of plants and trees is closely connected with botany, we recommend that all fruit growers should make botany a special study, especially those parts relating to their business.

On motion of Mr. Smith the resolution was adopted.

Mr. Sias. Mr. President, as long as we are on miscellaneous business, I would like to state to the convention that since I came to the convention I have received two communications from Rev. G. W. Fuller, of Litchfield, now our delegate to the Iowa meeting. The first was written November 18th. He writes that he was to start for Iowa, and expresses in this regret in regard to the handling or management of the Finance Committee's report. You will recollect that Mr. Fuller was the chairman of the Finance Committee last year; and you will also notice that in the report of last year our secretary states that at the close of the convention this report of the Finance Committee could not be found. He states in this letter that if the Secretary had wished to put it on record he could probably have easily found it by calling on our reporter, and he said that he would try and find the report. In the next communication he encloses a copy of the Finance Committee's report. I would say that I was a member of that committee and have looked the report over carefully, and I am satisfied it is a correct copy of the report of the Finance Committee; but I do not wish to take up the time of the convention to read that report unless it is called for. I have a copy here in my hands and if the convention calls for it I will read it, but I presume it is not necessary. But in order to satisfy our chairman I will move that this report be accepted, or put on file and be printed in the forthcoming report of our transactions.

President Smith. Before that motion is put I would like to have a few words to say. I thought that matter was settled last year; I cannot see the advantage at this time of bringing up that report. I would much prefer that that report be brought up and acted upon when Mr. Gibbs and Mr. Fuller were both present; I don't think we should act upon that report while they are ab-

sent. I think it better to lay it upon the table until another winter, when they will both be here, and then if there are any explanations to make they can make them. I cannot see any good in putting it upon the record at this time. To take it up when they are both absent it seems to me should not be done; that is the only objection. I have no objection to its going on the record.

Mr. Sias. Mr. President, in order that the members should have a knowledge of this business it seems to me that they should have the report and have it published so they can read it, and if there is nothing objectionable in the report its contents ought to be known; but if it is suppressed from the transactions it certainly is not using the committee exactly fair. It is nothing unusual and there has been nothing of the kind done before. It seems to me there would be no objections to having it read if it does not go into the transactions. The facts were misrepresented to the society, or they would never have voted on it as they did; I am satisfied of that. I think it ought to be read.

Mr. Dartt. Mr. President, just putting a report on record isn't anything new; it has been presented to the society and it should have been on record already; it is only supplying the record with a missing link. I don't suppose anybody wants to do anything about it only it should appear in print as presented by the Finance Committee, that is all. I don't see how there can be any objection to that.

The motion was then adopted.

The following is the report referred to :

FINANCE COMMITTEE'S REPORT FOR 1884.

We think it our duty to the Society to call attention to one or two things, and the first of them is the very large expense incurred during the past year.

Especially those in connection with our exhibit at Philadelphia. Here are charges for \$215 for simply gathering the fruit, and then the expense of the delegate \$147, making a total of \$362. We do not say the exhibit could have been made for less, but think it ought to have been.

Another matter to which we call attention is that our constitution has been violated in two respects. The by-laws of 1878 provide that the Executive Committee shall in no case incur expense exceeding \$50, except by authority of the vote of the

society at its annual meeting when the specific amount so appropriated shall be designated.

And article third requires that the treasurer shall pay out funds only on order of the secretary, countersigned by the president. But the requirements have been disregarded the past year, as expenses have been incurred by the Executive Committee, much beyond that amount, and several orders have been sent to the treasurer signed only by the secretary and chairman of the Executive Committee. We would not say that this was for any wrong purpose, but we think the only safe course is to keep clearly within the constitution, and not allow a dollar of the money committed to us by the State for a specific purpose to be wasted or spent needlessly.

We recognize the activity and earnestness of our officers, and especially of our secretary and think reasonable compensation for our secretary should be allowed, but beyond this we think strict limits should be placed.

G. W. FULLER,
A. W. SIAS,
M. PEARCE,
Committee.

From *Minneapolis Tribune*, Jan. 18, 1884.

SECRETARY GIBBS' ANNUAL REPORTS.

The report of Secretary Gibbs was read and adopted. Also the financial report of the secretary, which was referred, without objection, to the finance committee.

STATE HORTICULTURAL SOCIETY.

DR.

Secretary's Statement of Expenditures for Postage, Office, Traveling and Incidental Expenses, for the year ending Jan. 12, 1885.

1884.

Jan.	8.	Postage stamps.....	\$1 00
	8.	Padlock for box.....	25
	12.	Postage stamps.....	1 00
	14.	Railroad fare to Minneapolis and return.....	4 55
	14.	Meals and incidental expenses for annual meeting, including two trips from Minneapolis to St. Paul.....	3 20
	15.	Expressage on books for annual meeting.....	50
	15.	Expressage on apples for exhibition at annual meeting.....	50

	18.	Telegrams.....	1 05
	18.	Stationery for meeting	40
	26.	Kansas City papers of proceedings of Mississippi Valley Horticultural Society, and mailed to members.....	5 00
	29.	Postage stamps.....	35
	30.	Trip to St. Paul and Minneapolis.....	5 75
Feb.	1.	Postal cards.....	75
	1.	Ink and stationery.....	20
	1.	Stamps.....	52
	2.	Stamps.....	15
	4.	Stamps.....	1 00
	4.	Express charges on copy to State printer.....	25
	12.	Postage stamps.....	1 00
	12.	Express charges on reports.....	60
	16.	Postage stamps.....	1 00
	18.	Envelopes (stamped).....	56
	21.	Postage stamps.....	1 00
	22.	Mucilage (25c), postage stamps (50c).....	75
	26-27.	Trips to Minneapolis (\$2.55, \$4.55, \$1.60).....	8 70
	27.	Postage stamps and paper wrappers.....	2 24
	28.	Envelopes (stamped) (67c), postage stamps (50c).....	1 17
	28.	Postage stamps.....	75
Mch.	4-7.	Trip to Minneapolis in connection with printing report....	6 00
	8.	Postage stamps.....	2 25
	10.	Trip to Minneapolis (reading proof).....	1 50
	11.	Trip to Minneapolis (reading proof).....	1 50
	13.	Trip to Minneapolis (reading proof).....	1 50
	14.	Expressage on manuscripts to State printer.....	25
	15.	Rubber bands.....	25
	22.	Trips to Minneapolis (reading proof) 17, 19, 21 and 22....	6 00
	26.	Expressage on reports.....	50
	29.	Trips to Minneapolis (reading proof) 24, 26, 27, 29.....	6 00
	31.	Postage stamps.....	1 10
April	1.	Sending out circulars (labor \$1, postage 50c).....	1 50
	5.	Trips to Minneapolis (reading proof) 1, 3, 4, 5.....	6 00
	5.	Postal cards.....	1 00
	10.	Postage on reports.....	7 00
	10.	Telegram from State printer.....	25
	12.	Trip to St. Paul and Minneapolis.....	1 50
	14.	Postage on reports.....	17 00
	14.	Expressage on Michigan report.....	1 25
	14.	Expressage on Minnesota reports from printer.....	75
	14.	Trip to St. Paul and Minneapolis.....	1 80
	18.	Postage stamps.....	32 00
May	13.	Postage (stamps \$14, wrappers 56c).....	14 56
	15.	Extra printing.....	2 75
	28.	Expressage on Minnesota Horticultural Reports	80
June	2.	Freight bill on reports.....	1 79
	2.	Drayage on reports.....	50

	2.	Postage on reports.....	5 00
	2.	Traveling expenses.....	1 00
	7.	Postage stamps.....	2 00
	7.	Postal cards for printing.....	2 50
	11.	Postage stamps for programmes.....	6 00
	11.	Postage stamps.....	2 00
	13.	Freight bill on reports.....	1 66
	24.	Traveling expenses, etc., to summer meeting.....	2 75
	26.	Drayage on report.....	50
	27.	Printing.....	5 75
July	19.	Postage stamps.....	6 00
	22.	Expressage on Kansas Reports.....	1 40
	28.	Expressage on Illinois Reports.....	95
Aug.	4.	Postage stamps.....	1 10
	4.	Expressage on reports to C. Ludluff and Andrew Peterson	70
	20.	Expressage on reports to Iowa.....	1 10
	20.	Postage stamps.....	1 00
	25.	Postage stamps.....	2 50
Sept.	2.	Postage stamps for circulars.....	2 50
Oct.	23.	Postage stamps.....	5 00
	28.	Expressage on Montreal Reports.....	2 05
Dec.	29.	Printing circulars.....	3 00
	29.	Postage stamps for reports.....	10 00
Jan.	5.	Stamped envelopes.....	2 28
Total.....			\$230 23

CR. BY

1884.			
April	10.	Order on treasurer.....	42 95
	10.	Order on treasurer.	36 59
June	18.	Appropriation for postage, etc.....	100 00
	25.	Order on treasurer.....	4 86
	25.	Appropriation	100 00
Total.. ..			\$284 40

SUMMARY.

Total expenditures from Jan. 5, 1884, to Jan. 12, 1885.....	\$230 23	
Total receipts from Jan. 5, 1884, to Jan. 12, 1885.....		\$284 40
Balance due Horticultural Society.....	54 17	
		<hr/>
		\$284 40 \$284 40

STATE HORTICULTURAL SOCIETY.

Secretary's Statement of Receipts and Expenditures for the year ending Jan. 12, 1885.

Postage	\$134 28	
Traveling expenses as secretary.....	56 55	
Expenses of annual meeting.....	4 60	
Telegrams	1 30	
Stationery.	70	
Expressage	10 60	
Printing	11 50	
Freight and drayage.....	4 45	
Sundries.....	6 25	
<hr/>		
Total expenditures	\$230 23	
Per order on treasurer		\$42 95
Per order on treasurer		36 59
Appropriation for postage		100 00
Order on treasurer.....		4 86
Appropriation for current expenses.....		100 00
<hr/>		
Total receipts.....		\$284 40
Balance due State Horticultural Society.....	\$54 17	
<hr/>		
	\$284 40	\$284 40

TREASURER GRIMES' REPORT.

The treasurer's report was then presented, and, on motion of Mr. Harris, referred to the Finance Committee.

The report of the treasurer was as follows:

To the President and Secretary of the Minnesota State Horticultural Society,

GENTLEMEN: I have the honor to submit the following report of the receipts and disbursements of the society for the current year ending Jan 20, 1885:

RESERVE FUND.

1884.		
Jan. 15.	Accrued principal.....	\$600 00
15.	Accrued interest.....	43 78
1885.		
Jan. 20.	Interest for the current year.....	38 62
20.	Reserve principal for 1884.....	200 00
<hr/>		
Reserve fund, total.....		\$882 40

RECEIPTS.

1884.		
Jan.	15.	Balance in treasury..... \$172 29
	15.	Of secretary membership fees..... 108 00
Feb.	20.	E. H. S. Dartt, one member..... 1 00
March	31.	Balance State appropriation, 1883..... 400 00
June	13.	State appropriation to July 31, 1884..... 500 00
	25.	Of Secretary Gibbs, membership fees..... 37 00
	25.	Harlow Gale (donated)..... 5 00
Nov.	11.	Secretary Gibbs, for membership..... 11 00
	12.	A. J. Phillips, one membership..... 1 00
	15.	Secretary Gibbs, two members..... 2 00
1885.		
Jan.	17.	Of the State treasurer..... 500 00
Total receipts.....		\$1,737 29

DISBURSEMENTS.

1884.		
Jan.	18.	To Lake City <i>Graphic</i> , printing..... \$17 35
	18.	Oliver Gibbs, Jr., balance on account..... 69 96
	18.	W. B. McHenry, printing..... 13 50
	18.	J. S. Harris, time and expenses..... 50 00
	18.	E. A. Cuzner, librarian's expenses..... 3 05
	18.	E. A. Cuzner, shelves for library..... 15 00
	18.	E. A. Cuzner, librarian's salary..... 10 00
	18.	M. C. Messner, reports..... 20 00
	18.	Oliver Gibbs, Jr., secretary, first quarter's salary..... 50 00
	18.	A. W. Sias, expenses on Seedling Fruit Committee..... 10 00
	18.	J. T. Grimes, funds advanced on account..... 81 00
	18.	Premiums paid at winter meeting—
		On fruits..... 80 00
		Vegetables..... 7 00
		Canned fruits..... 9 00
		Fine arts..... 10 00
		Seeds..... 6 00
Feb.	20.	E. H. S. Dartt, delegate to Iowa..... 23 10
	23.	A. W. Sias, delegate to Wisconsin..... 4 75
	22.	Expenses Executive Committee to St. Paul..... 18 80
April	1.	M. Pearce, delegate to Kansas City..... 37 40
	2.	M. C. Messner, assisting the secretary..... 20 00
	2.	Oliver Gibbs, Jr., secretary, first quarter's salary increased..... 50 00
	2.	Oliver Gibbs, Jr., distributing reports and incidentals.... 100 00
	2.	M. C. Messner, balance for services..... 20 00
	10.	M. C. Russell, printing and stationery..... 13 50
June	13.	F. G. Gould, on order of Jan. 18, 1884..... 3 00
	2.	Oliver Gibbs, Jr., second quarter's salary..... 100 00
	25.	C. L. Smith, expenses at summer meeting..... 5 00

	25.	Harlow Gale, rent of hall.....	5 00
	25.	T. M. Smith, president, incidentals.....	5 22
	25.	Oliver Gibbs, Jr., postage.....	4 86
	25.	Oliver Gibbs, Jr., 'or incidental expenses.....	100 00
	25.	M. C. Russell, printing programs.....	9 00
	25.	Premiums paid at summer meeting,	
		On fruits.....	29 00
		Flowers.....	29 50
		Vegetables.....	19 50
	25.	Geo. S. Woolsey, special premium.....	10 00
	25.	C. L. Smith, services as lecturer, being one-half of eleven	
		membership fees procured by him.....	5 50
April	10.	Oliver Gibbs, Jr., traveling and hotel expenses.....	42 95
	10.	Oliver Gibbs, incidental expenses from Jan. 8 to April 10,	
		1884.....	36 59
Sept.	2.	Oliver Gibbs, Jr., third quarter's salary.....	100 00
1885.			
Jan.	20.	Reserve fund for 1884.....	200 00
	20.	Treasurer's salary for 1884.....	25 00
	20.	Librarian's salary for 1884.....	10 00
			<hr/>
			\$1,479 43
		Balance in the treasury.....	257 86
			<hr/>
		Total.....	\$1,737 29

REMARKS.

I would respectfully call your attention to the fact that the finances of the society are insufficient to meet the expenses and maintain the reserve fund which was placed by order of the society as a special premium fund to encourage the originating and dissemination of new varieties of apples, specially suited to supply the demands and wants of the orchardists of this State.

The fiscal year of this society commence at the annual meeting in January, whereas, by act of the legislature the State appropriations are paid semi-annually and become due on the thirty-first day of July and the thirty-first day of January, consequently we have now drawn the first apportionment for the year 1885; two hundred dollars, which I have placed to the reserve fund, from which it was borrowed by order of the society to meet the current expenses for the year 1884.

It must be apparent that we are not managing our affairs in a practical, business way; either we have undertaken to do too much for our means, or we are spending our money without an equivalent.

It is supposed that the officers of the society are paid a

reasonable salary for their services, but bills have been presented and orders drawn and signed by the proper officers which have not even been allowed and audited by an executive or finance committee.

I have particular reference to those in connection with the secretary's office.

My books show the following amounts to have been paid upon those orders during the current year:

For distributing reports.....	\$100.00
Traveling and hotel expenses.....	42.95
Reporter's services.....	60.00
Printing.....	53.25
Incidental expenses.....	211.41
Total.....	<hr/> \$467.61

The amount, in addition to the office salary of \$400, nearly equals the State appropriation, and leaves but little, except membership fees, to meet the expenses and carry on the work of the society.

Compared with other years I also find that those expenses have more than doubled in geometrical proportion with each year since we have received aid from the State.

There was paid for incidental and other expenses contingent to the secretary's office for the following years, to-wit:

For 1881.....	\$16.31
" 1882.....	71.35
" 1883.....	202.03
" 1884.....	467.61

I have deemed it my duty to lay these facts before you, and would respectfully recommend that hereafter all bills for incidental or other expenses should be itemized in due form to be audited, allowed, and certified to by the executive or finance committee prior to orders being drawn upon the treasurer, and that no orders be allowed or moneys paid out by this society in advance of services having been rendered.

Respectfully submitted,

J. T. GRIMES,

Treasurer.

OFFERING PREMIUMS.

Mr. Dartt then offered the following resolution:

Resolved, That in offering premiums on apples especial prominence should be given to Minnesota productions; and in bringing out new varieties many premiums on separate plates of such fruits as are new varieties will be more likely to promote the end sought than offering large premiums on collections.

DISCUSSION.

Mr. Harris. Mr. President, last year, in order to draw out as large a collection of seedlings as possible, we made very liberal premiums on seedlings, at least compared with the means we had at our command. There was one premium, offered for a collection, of ten dollars, and one of five dollars, and at least five or six premiums on Siberians; premiums for all purposes—best sweet, best winter, best autumn, etc.; and I am willing that you should, and the society are probably ready to start in motion this action on the part of the society as to the arrangement of those premiums. We consider the encouragement offered towards the production of seedlings is an important matter. The agricultural society have always co-operated with us and given us almost everything we asked. There is no society hardly that gives one-half the premiums that we do. I am in favor of this. I move to amend that we request the agricultural society, in making up their premium list, to omit a premium for a collection of Siberians.

GRAPES AT NEW ORLEANS.

Gen. Jennison, secretary of State, here appeared and presented the following telegram from Mr. F. G. Gould:

EXPOSITION GROUNDS, }
NEW ORLEANS, LA. Jan. 21, 1885. }

Gov. Hubbard, at State House:

Grapes awarded three silver medals, ten prizes in all; only medals except California; we break Ohio on Catawbas also.

(Applause).

Gen. Jennison. I judge from that that there are ten prizes offered and that Minnesota gets three silver medals, the only ones

obtained except by California, and that among them is the prize on Catawbas, which is ahead of the one which Ohio gets. I think, to speak as a politician would, that somebody must have "set 'em up."

Mr. Harris. The object of my amendment was to prevent the loading of our tables at our State fairs with something which is not sightly or ornamental, which has no educating influence and which does no good.

Mr. Dartt. Mr. President, what has been said in regard to crabs not being ornamental or useful, I think is a mistake; they are decidedly ornamental and decidedly useful, some more than others. There is no danger in this State, as a general thing, of getting too great an exhibit of fruit. The premium on the collection of crabs may be small, but let them bring them all in, so we will have a chance to test the different varieties. I think it is decidedly proper, as much so as it is to have a good collection of apples. If you want to exclude all varieties, offer premiums on the best plates. On these seedling apples the object is to have many premiums on separate plates, so that if there are twenty varieties that are brought in that are valuable, nearly all of them will get a premium,—first, second, third or fourth premium. I would have five or six premiums on the best winter apples, and I would place it pretty well up. You would be more likely to get the apple you are looking for in the next ten years than you will from your experimental stations, because it will take them ten years to bring out a thing and perfect it. Trees when young are hardy, most all of them, and as soon as they get a little old they die.

The question being upon the amendment of Mr. Harris, and a division being called for, the amendment was carried, eleven to nine.

Mr. A. W. Latham. I want to speak on the question. If the object is to make a large show of fruit rather than to make an exhibit of fruit for choice plates, I think you are taking the wrong course in passing the resolution.

Mr. Smith. The object is not to put it on a few choice specimens, but, if possible, increase the number of choice specimens by making a greater variety.

Mr. Dartt. This relates to seedlings and new varieties.

Mr. Latham. There are many who grow more varieties of crabs, and many would like to compete for premiums; but if it is known that one has a large number of them, he will not exhibit

his varieties, because if he does not get the first premium he cannot be at the expense of getting up an exhibit. You offer, for instance, ten dollars for the best collection of varieties on exhibition, but the ten dollars will not pay for the expense. The apples are all right, but they are of no value after they have been exhibited. Perhaps you may have put up forty varieties. If you increase the premium for a general collection, or offer a premium that will cover the largest exhibit, and make four or five that are all respectable, those collections, every one of those, will show you thirty or forty plates. They should not be counted unless they are creditable exhibits. This exhibit here of grapes, of course, has been kept with a great deal of difficulty. Fifty dollars in premiums, for a general collection, will draw out ten times as many plates as the same amount of money offered in premiums for single specimens.

The resolution of Mr. Dartt was then adopted.

Capt. Blakeley. Mr. President, your committee have visited the honorable Senate and House of Representatives; the Senate accepted the invitation of the association; the House was engaged in important discussion at the time, and the speaker informed me that he would announce the invitation, and no doubt it will be accepted and they will visit us.

Mr. Harris moved that the society request the State Agricultural Society, in making up their premium list, to give a separate class exclusively for the new Russian varieties, offering premiums for collections and for different varieties that are known to be cultivated in the State.

Mr. Dartt. The resolution that has been passed already covers that ground. All new varieties, it don't say seedlings; it was intended for new varieties, Russians and seedlings.

Mr. Harris. I am in favor of having the Russians shown in a class by themselves, and to have the seedlings in a class by themselves, and to have liberal premiums given on each. You will accomplish far more good in that way, and that is the reason I make this motion. While classed in that way, in the sweepstakes in their class they would not be permitted to come in.

The motion was adopted.

Mr. Whipple. I would like to say one word about striking out all of the crab class. Now, we have had a decision in our courts within two days that I believe will make us trouble. You all recollect the case where a pair of mules were stolen in Hennepin County within the last year. On our statute books we have

a law providing for two hundred dollars bounty for the detection of horse thieves. The thief was captured that took the mules, and the man that captured him applied for the bounty, which was refused, and he carried it to the supreme court, which has just decided against him that mules are not horses. Now, you are trying to strike out a variety of apples entirely and offering premiums on the new seedlings. If you find an apple that is the least crab, you strike it from the list; and so I think you will have to strike out nearly all of your seedlings.

President Smith. We have not struck out the crab apples.

Mr. Smith. They simply strike out the one premium on the largest collection of crabs in order to put it on the other premiums.

Mr. Sias. I wish to say that our secretary of the Olmsted County Horticultural Society made us a good report last year, and it was handed to the secretary of this society and a vote taken to have it filed for publication with the transactions of the society, but whether it was lost or suppressed I don't know; and I wish our new secretary, whoever he may be, may be instructed to try and find that report and have it inserted in our next report.

Mr. Smith. We have already voted to do that.

ANNUAL MEETING OF THE OLMSTED COUNTY HORTICULTURAL SOCIETY, 1884.

ADDRESS OF J. S. HARRIS, OF LA CRESCENT—ELECTION OF
OFFICERS, ETC.

[*From the Rochester Post of Jan. 4, 1884.*]

The annual meeting of the Olmsted County Horticultural Society met at Good Templars Hall on Saturday afternoon of last week, Vice President Sias in the chair. But a very few members were present to listen to the very interesting and instructive address by Mr. J. S. Harris, president of the State Horticultural Society, consequently we publish it in full. The speaker said:

Mr. President and Gentlemen:

It is with pleasure that I meet with you in this your thriving city, which is noted far and near for beauty of situation

and for the intelligence, enterprise and hospitality of its people. Rochester has become the metropolis of the most fertile and prosperous county of this State. But nothing brings up to me more pleasing associations and hallowed memories than the fact that this city is the first in the State where any organized and systematic efforts were made in horticulture, and that it was here that the Minnesota State Horticultural Society had its birth, and that here I have met with her people at six State fairs and one Southern Minnesota fair and exposition, where has been made the grandest horticultural exhibits ever seen in the State of Minnesota. We have assembled together to-day to engage in the means to promote an art that is suited to man's highest destiny. It is an art that is calculated to afford the intellect abundant themes to which a patriarch's long life might be devoted with increasing gladness, for it extends above, around and beneath us; its beauties are without limit, its varieties without end. There is no human science that is so ample in its range, so attractive in its allurements; there is no occupation of man that is so ennobling, or that brings him so intimately in connection with nature and nature's God. Its votary has the wide world of beauty unfolded to his view as a living landscape. Both as a science and as an art, horticulture, if it be properly appreciated, is abundant in its resources. It has numbered among its votaries the wisest, ablest and best men of all ages and of every nation. They have gathered, transferred naturalized and adapted to our uses whatever of earth's products can please the eye, satisfy the appetite, or regale the senses, or is of any use whatever in sustaining life or promoting the happiness of man, and it is their enviable occupation to "dress and keep" them according to the divine command what they have thus gathered and arranged. A boundless theme is here presented. It is the application of the art. It is to sow and plant, to prime and train, to transplant, to propagate by grafting, cutting, layering and mulching; and connected with these operations are remarkable phenomena that lead the mind to pleasing and elevating thoughts, for it may thus dwell on many of the most interesting pages of the book of nature. An art that is so abundant in its resources and that has occupied the meditation of the learned for past ages is worthy of at least a little of our consideration. It is the art that means gardening of every kind the world over, gardening by the orchardist, the vineyardist, the florist, and the tree-planter; it includes the

amateur and the professional cultivator, the market gardner with his broad acres, and the poor woman with one solitary geranium in a broken crock. The science covers alike gardening for profit and gardening for pleasure; gardening of whatever character and wherever found. This art has made wonderful progress in this country in the last half century, and very much of this progress is due to the victorious power of organization. The achievements of individuals may be very great, but if they are not made the common property of association, the secrets may perish with them, or be as lights hidden under a bushel. No man is so wise and so old in wisdom that he may not learn from others. Few men are so inexperienced that they cannot impart some strength to an organization or do some good to their fellows. No being is so strong that the strength of another, in some emergencies, would not be a help to him. Every man is supposed to know something and to know it better than others, and it is a great and good thing for a man to find his true place in society and properly fill it. He thus finds his true use antagonizing no one and yet helping every one. In all well organized bodies of workers each member not only brings to the meeting the experience he has gained in his avocation, but he shows a disposition to help others, and if differences arise, in brushing against them he may get some sharp angles knocked off, but he will return home a better informed man, and if he has had a good time, as he ought, he will be younger in heart. The study and practice of horticulture, or any other noble subject that brings man in contact with nature, inspires a tendency to keep the heart young. Those who belong to such associations and attend the meetings will become students, and there is nowhere a better opportunity afforded to acquire a practical education.

Mr. President, horticultural societies have a mission in this county and the whole of Minnesota; they have a great work to perform, and the demand is imperative that our best workers should come to the front and enter immediately upon the work. Let learning, genius and talent come forward and join with practical skill and indefatigable industry in solving the gigantic problems of the hour. Whether we realize it or not, there is a peculiar need for the work. In agriculture, commerce and manufactures, our State is making unparalleled progress and commanding the attention of the whole civilized world. In only one thing is she behind the most favored countries, and that is horticulture. Our grain fields, our dairies, our sheep folds, and our

lakes, rivers and brooks, stocked with the best of fish, all bid defiance to grim want, and with only such an amount of skillful labor bestowed upon them as is necessary for the perfect physical development of our natures, the earth yields up her treasures, and we have bread enough, and to spare. When horticulture is fully developed; when we have fruit enough, all of our own raising;—the luscious apples, melting pears, and grapes that hold the wine in the clusters—when every farm has its orchard of fruits, and well kept gardens of flowers and vegetables, its lawns and shade trees; when our country school houses shall stand upon ample grounds and be surrounded with trees and shrubbery to break the chilling blasts of winter and impart cooling shade in summer, and grassy lawns and beautiful flowers greet our children upon their play-grounds and shed a fragrance about their lives; when the broad prairies are dotted over with groves and forests, and stately trees adorn our highways, to afford comfort and shelter to the weary traveler, and bid defiance to the tornado and cyclone, then shall Minnesota be the best and most desirable spot for a home that the sun ever shone upon. All these things must be supplied and brought about through the agency of horticultural societies.

Now the question I ask is: When shall it be done? Very soon or far away in the future, after we and other generations have passed away to our rest? Now is the time to enter upon the solution of these questions, and I would that I were able to stir up your minds to enter upon them with such zeal that our horticulture might quickly overtake and keep pace with our progress in all other arts and avocations. The first important factors in the work are education and organization. Secure the latter, and we will find the first following close in its tracks. We need a live horticultural society in every county, if not in every town, in the State, that shall meet every month and devote an afternoon or evening to the consideration of these subjects. You have a society here. Permit me to ask: What have you done, and what are you doing? If you have done what you could and should, you stand as a beacon light to show others the way to success. You and every farmer in Olmsted County, and every householder with one rod of ground, and every citizen who is interested in the future growth of this city and the development and prosperity of the county, and the happiness of this and future generations, ought to cherish your organization and throw into the Olmsted County Horticultural Society your combined

strength and talent. One of the most efficient means for solving some of the difficult problems is by experimental stations, maintained under the fostering care of horticultural societies. A few men in your county are raising some varieties of fruit, and are perhaps raising it successfully and profitably, but the majority are not. Thus far there are but two or three varieties of apples that are doing reasonably well with the masses of the people, and they supply only a small part of the season during which apples are wanted. To secure varieties to cover the remainder of the season, large sums of money have been paid out to nurserymen and tree venders for trees, and the result has been only disappointment and vexation, and you have had to do without the anticipated fruits or purchase them from some more favored locality. Now if I believed that the climate and soil of Minnesota would forever prohibit the raising of apples and similar fruits in quality of the very best and in quantity adequate to the wants of all our people, as much as I admire it for everything else, I would get out of it as quick as possible and cast my lot with some other people.

Gentlemen, we have the Duchess and some good descendants of the Siberian species that are hardy, and from them, were there no other alternative left, it is possible to secure the rest. But we have other means at command, and should avail ourselves of them promptly. As early as 1866 I made the statement upon the State fair grounds in this city that I believed it lay in our power to make this one of the best fruit or apple producing states in the Union, and I have repeated that statement every year since, and I shall never cease doing so while my life lasts or until I see the promise fulfilled. I believe in the statement, and because I believe, I have given the subject study and the work of the best years of my life. I have not accomplished much. In such work few men can, single-handed and alone, but I do hope that I have planted where others shall reap.

I have somewhere read that he who originates a new and valuable fruit suited to general cultivation is as much a benefactor of mankind as he who discovers a new principle in science which adds to the comfort and happiness of our race. The names of the men who invented the steam engine, the telegraph, the reaper, the sewing machine, and other modern appliances will not be held in more sacred remembrance than will those who finally originate and disseminate hardy varieties of fruits that will prove perfectly adapted to this State. It is to modern

science that the world is indebted for those wonderful discoveries and inventions, and modern science has made it possible for us to produce and reproduce and change at will the products of the earth. Knight, Herbert, Lindley, Darwin, Gray, Bull and other teachers of our day have given us lessons of wisdom which will enable us to prosecute the noble work. It has often been asserted, and is pretty generally believed, that tender exotics may by degrees become accustomed to colder climates and thus become acclimated. Many plants, it has been asserted, which were not originally so, had become hardy. Now, while many plants have the power of adapting themselves to new conditions, I do not suppose it is possible to make a species of plants hardy that were not originally so. It is a law of nature that the stream cannot rise above the fountain head. I claim that the apple tree was originally hardy enough for this climate, and that the losses that occur here should be attributed to some other cause than the severe cold of our winters. Were they not so, they could not grow and yield fruit in Northern Europe, where the cold is much more intense than here in Minnesota. All plants have certain peculiarities and are capable of certain modifications, and it is in the power of man to control these peculiarities, and, in a manner, to cause production by the selection of those which promise well, and continuing the selection with great care through several generations of seedlings, and by that means, and that only, a variety may be originated with peculiarities suitable to a certain climate.

The recent explorations of Budd and Gibb in Northern Europe give us strong assurance of final success, because we learn through them that that inhospitable climate does not debar its inhabitants from enjoying an abundance of such fruits as the apple, pear, plum and cherry. Tradition tells us that those fruits were advanced from further south, and that, too, without that aid which modern science has placed at our command. The climate of that country is so much more inclement than ours, that many of our fruit growers believe the question already solved, and that we have only to wait until trees can be grown here from cions procured there, and they will no longer make an effort to produce what they need by originating Minnesota seedlings.

Mr. President: If this course is pursued, I fear that we are very far from the end. If our farmers plant their orchards with those Russian varieties, with the expectation of having good,

hardy, long-keeping varieties, and thrifty, productive orchards, there is danger that they will be doomed to disappointment. I tell you, the whole thing is an experiment and should be treated as such until we have some certain knowledge of their adaptability to our wants. The experiment may prove but little better for supplying present wants than that of the plants of our orchards had been to Baldwins and Greenings. It is the seedlings of these, crossed with our best Minnesota varieties, that are to give us our future orchards and earn for our State an enviable reputation for the beauty and quality of her fruits. It has long been known that varieties originated in certain localities and soils are generally better suited to those localities and soils than those introduced from other places, and our own experience has demonstrated that there are comparatively few of the good varieties of other countries that are anything like a success with us. An all-wise Providence has provided for perpetuating species. The little seed, when brought under favorable circumstances, sends out roots to penetrate the soil to gather up moisture and food, and a stem and branches and leaves and flowers and seeds to elaborate the secretions and acquire qualities that shall enable the coming tree to become adapted to the condition under which the seed was produced. Therefore, the true principle for us to pursue is to save and plant the seeds from our hardiest and best varieties, either hybridized or cross-fertilized with Siberian or Russian varieties. Always saving from both parents those having some characteristics we wish to perpetuate in the offspring, and each generation so produced will become more "at home" under our climatic conditions.

I do not think that I stand alone in my opinions upon this part of my subject; but doubtless what I have said will receive some severe criticising. In closing this part of my subject permit me to quote from the address of the venerable Marshall P. Wilder, president of the American Pomological Society, at their late meeting. In speaking of the production of new fruits he said: "It is now more than thirty years since I first called the attention of this society to the importance of producing fruit from seed in order to originate and obtain such varieties as might be adapted to the varied climate of our ever increasing and immense territory. Thus have I spoken for a long course of years of the importance of this branch of our duty. Thus would I preach while life lasts. Plant the most mature and perfect seeds of the most hardy, vigorous and valuable varieties, and,

as a shorter process, insuring more certain and happy results, cross and hybridize our finest kinds for still greater excellence.”

“ Plant the best seeds of every good fruit.
Good fruit to raise, some lands to suit;
Fruits which shall live their bounties to shed
On millions of souls when you shall be dead.
These are creatures that do the world good.
Treasures and pleasures, with health in your food.
Pleasures which leave in the memory no sting,
No grief on the soul, no stain on time’s wing.”

I have before alluded to forestry as part of the work of horticultural societies. Forest trees are known to exert a favorable influence on the climate, and a beneficial influence on fruit culture and gardening, and they are so essential to the comfort and safety of man, that their planting and encouragement present a worthy subject for our consideration. I have never felt its importance so much as since the great cyclone of the twenty-first of last August, destroyed a portion of your beautiful city, striking terror to the hearts of all, and causing much suffering and loss of life. Shortly after that event I spent a few hours in making observations over the scene of destruction, and from what I observed, I am satisfied that forest trees are the greatest boon that can be given to portions of this State. Among other things, I observed that buildings surrounded with screens of cottonwood and other timber suffered less than where there were no trees, and in some instances escaped with only slight injury, and I am satisfied in my own mind that it lies in the power of man to avert much of such fearful calamities. If, twenty years since, or even ten, there had been planted and cared for twenty acres of fast growing timber, such as cottonwood and willows, upon every quarter section of land for ten miles up the Cascade Valley, and, in addition, trees had been planted about the farm buildings and along the roadsides, that terrible storm would have passed almost harmlessly over you. If the saving of human life and property from such destruction, if comfort, happiness, and a feeling of security are of any account, let it stimulate you to encourage the planting of trees upon every farm and along every highway in the county. They will not only serve as a protection, but will enhance the value of property, and lend charms to the country, and, by judicious selections of varieties will, in the course of time, prove more remunerative than any other crop

raised upon your farm. As an instance of their value for protecting orchards, I will refer you to the orchard of Amos Welch, upon Greenwood prairie, which, in spite of the winds and tornadoes, were, on the sixteenth of September, literally loaded down with as fine fruit as I have seen in any of over one hundred orchards I have visited in the past season.

I had much more that I had desired to say to you, but your time is too precious to be spent in listening to such feeble efforts as mine. Remember, that you are called to do a great work. Do it well. Give your horticultural society support. Work to have its benign influences spread over the whole county, until every man, woman, and child shall have received good from it. Discuss every horticultural topic that has any bearing upon the welfare of the people of county or town; conduct experiments in the originating and propagating new and valuable fruits; encourage a higher education and a nobler home life; work until your mission is fulfilled, and every farm has its forests and groves, orchards and gardens, and the whole land shall blossom as a rose, and every home shall be surrounded with such attractions that no temptation shall be strong enough to lure away the inmates to dissipation and vice; and when you have done with the work, you will leave a goodly heritage for future generations.

On motion, a vote of thanks was tendered to Mr. Harris for his able address.

Mr. Harris said he was disappointed to find so few of the farmers of the county present, and advised the association to hold meetings more frequently than they had been in the habit of doing. Some topic should be selected for discussion at every meeting and an effort made to get the ladies interested in the cause. Fairs could be held at the same time and farmers given an opportunity to display their products. At La Crosse, Wisconsin, they have papers read, followed by discussion on some of the more prominent features of the paper read, and vocal and instrumental music by ladies and gentlemen. They have a large attendance. He said that in some places picnics are held under the auspices of the society in summer. In Illinois some of the best speakers in the State are engaged in working up these societies. He said there should be a thorough reorganization of the society before next spring.

Mr. R. Porter said that the society should first undo things that had been done by some nurserymen in the State. While he

did not wish to cast any reflections on any nurserymen here, he thought a great many poor trees had been sold, and a great many farmers discouraged thereby. He was selling trees in Minnesota and Dakota, and handled nothing but what he knew to be good. He expressed a decided preference for the Duchess, Elgin Beauty, Wealthy, and Rollins Pippin apples. The Wealthy was first grown at Lake Minnetonka, this State, and was a splendid variety. Ten per cent of the trees would bear the second year. Crabs are nearly all hardy varieties. He had met with some opposition in Dakota from nurserymen in this part of the State. He had put but fifty acres of apple trees in Dakota, and thinks they will do as well there as here. We have got to sell our trees to Western farmers. In a short time we cannot raise apples enough to supply our home market. Trees born here are all right, but should be crossed with other good varieties. Russian fruit is worthless here for winter. The Elgin Beauty is a good fall apple, also the Wealthy. He thought the Rollins Russet a good keeper, but it blights sometimes; is a good bearer.

Mr. Harris said he came to the conclusion that there was no genuine horticultural society here. Horticulture includes everything in the fruit and vegetable line. There are twenty varieties of apples that do well in Minnesota, and the society should bring them out. A good society will bring new varieties to notice. By all means get the ladies interested in the raising of flowers, etc., and reorganize your society.

Mr. Hoag asked Mr. Harris if he had any plan for bringing out hardy varieties.

Mr. Harris replied that he would select seed of the hardiest variety. You should have an experimental farm and test your trees. If you find anything better than you have, get it.

Mr. Sias had been experimenting with Minnesota seedlings several years, and at the last session of the Minnesota State Horticultural Society had been placed on a committee on Minnesota seedlings. He had traveled quite extensively over the State and was well satisfied with the seedlings examined. He found a new variety in an orchard near St. Charles, the fruit of which is as large as the Duchess, and keeps well. The tree stands on a high prairie with a southern slope. The tree was planted some time ago by a man now living in Dakota, and he would correspond with him and ascertain more about the variety, and report hereafter.

Mr. Harris said he had a seedling grafted with Talman Sweet,

the fruit of which lasts until May, and is a good eating and cooking apple. It blights some, but he thinks it can be improved. On motion, the meeting proceeded to the election of officers for the ensuing year, with the following result:

President—A. W. Sias.

Vice President—H. Porter.

Secretary—S. W. Eaton.

Treasurer—M. J. Hoag.

Executive Committee—A. W. Sias, M. J. Hoag, R. L. Cotterell.

Mr. Eaton suggested that the executive committee talk to farmers and try to persuade them to turn out at these meetings. A program should be arranged, consisting of reading, discussion, music, etc. He thought a good attendance could be had if it was properly worked up.

On motion the meeting adjourned, subject to the call of the president.

Mr. Dartt. I would like to take up the revision of the fruit list; if we don't get to more than one apple, that is so much gained.

President Smith. Is the committee appointed at the last meeting to revise the fruit list ready to report?

Mr. Smith. I want to tender Mr. Cutler a vote of thanks. His report is worth a hundred times more than any theory of a professional fruit grower on this subject. He was a farmer, and has succeeded by means of hard work; he has gone about it in a proper way. I don't believe in selling men strawberry and raspberry plants and fruit trees, and telling them they can grow them without any attention. Raspberries need care and protection and if they are not taken care of they will freeze down every winter. I don't believe in selling strawberry plants and telling men that they are going to raise a lot of berries when I know that at the end of two years they will not have any plants left. Mr. Cutler has written us just exactly what is needed for the people of this State, and he has told us in a plain way how he handles small fruits, and for this reason I want to give his report special mention, and I hope that the press of this State will give it as wide a circulation as possible.

Col. Stevens. The soil of McLeod County is very productive and adapted to raising fruits of any kind, and there is no

better in the State. I raised berries there years ago and I can do it again, and everybody else can, and they can raise apples too.

Mr. Smith. I don't think the soil of McLeod County is one whit better than other counties throughout the State.

Mr. Isaac Gilpatrick. I wish there should be a premium on strawberries, raspberries and currants; there don't seem to be any premium offered for those; we all talk at random, we want to know what the ground is. In Massachusetts, where I used to live, there was always a premium offered for the best fruit, and they had to state how it was raised, on what kind of soil, etc. I don't wish to put this as a motion, but I wish there could be some premium offered for small fruits. I wish that we could arrange so that we should know how they were raised, so that if a person has sandy soil he would know how to proceed; if it was wet that he would not need to mulch. My neighbors don't understand it, and they lose their crops. Couldn't something of that kind be done to help us out? There used to be a premium, but they never stated how the crops were produced, what climate and soil.

Mr. Tuttle. What kind of blackberries do you grow?

President Smith. We grow very few of any kind. Last year I saw very few in our markets. Mr. Ford here has raised more than anyone else; he can tell you, perhaps.

Mr. Tuttle. For a good many years I had the opinion that we could not grow blackberries successfully on account of the hot sun and want of shade. I set two plants in the orchard row some years since, and left them there; I didn't consider them of any account and never expected they would amount to anything; but in about two years from that time I picked sixty quarts of blackberries, and the plants had spread over a rod of ground. The second year after that I gave them no cultivation whatever; they were partly in June grass sod. They were the Ancient Briton. That year I had two hundred and fifty quarts on four rods of ground, and that was without a particle of cultivation. Now, there are other blackberries that have been made prominent and are generally considered better than the Ancient Briton, and where they are growing blackberries extensively. One man had eight acres last season at Berlin, Wisconsin. They grew Stone's Hardy or Snyder, but they give preference now to Ancient Briton. I can grow them better than you can grow raspberries. At Ripon they make a business of it. One man

goes along and puts a spade down on one side and throws a little dirt on the plant. I concluded to give my plants a little protection in the way of throwing some damp hay over the top of the plants. I put a trellis along by the plants and dropped a little wet hay on top. Two years ago this winter we had the coldest winter we have had, with one exception, for twenty five years, and they were hurt some; but they didn't kill as badly as the Snyders; the Snyders kill to the ground, but I conclude that I can grow 10,000 quarts to the acre of that blackberry, and it is a better blackberry than the Snyder or the Lawton. Ordinarily I can grow them without any protection. I concluded to let them take their chances. Only once since I have commenced growing have I lost crops by winter killing. My soil is a rich prairie, black loam, heavy clay down two or three feet deep. There are places on my place where I grow these berries, that the black soil is three or four feet deep; they don't do as well on that kind of soil as on heavier land. I don't make any difference in location of ground, whether to the north or to the south. My land is rolling land. You need not trouble yourself about slopes, but I prefer, or would rather have, a northern slope than a southern slope to keep them protected from the sun. I think they suffer as much from the heat of the sun as from the cold of winter. I examined my blackberry plants a week ago, and they appeared to be perfectly sound. They had thawed out and the wood didn't show any injury whatever.

Gen. Le Duc. Do you grow blueberries or huckleberries?

Mr. Tuttle. We grow them wild, but not where I live; the soil is not quite poor enough.

Gen. Le Duc. Have you ever transplanted them?

Mr. Tuttle. No, sir. We grow plenty of cranberries, and there are blueberries in abundance.

Mr. Harris. I will make a further statement on blackberries before the close of the meeting. It is now time to adjourn. I wish before we adjourn to call our brother horticulturists' attention to a new agricultural and horticultural paper which has been started in Minnesota, called *Farm, Stock and Home*, published in Minneapolis, semi-monthly, at the moderate price of fifty cents per year. If we would make this our own paper, and let our State pride reach forth and write for it, and get subscribers for it, and give it a circulation of 50,000 or 75,000, we would be doing a good thing and get a paper that could not be surpassed in the Union. We have talent enough in the State.

If we subscribe for this paper and make it our own, and make it the medium for the advancement of agriculture, we can advance it almost as fast as we can in our annual meetings. Col. Stevens, of Minneapolis, who has been the head and front of agriculture in the State of Minnesota, who sowed the first wheat sown in Hennepin County, and who went to McLeod County and opened a farm in the Big Woods, is the agricultural and horticultural editor of the paper, and this society I know indorses the colonel. Don't let us let the paper die out because we don't lend a helping hand.

Prof. Porter. There are a number of persons who have applied for membership of the State Amber Cane Association; those who wish to hand in their subscription can do so, and they will be entitled to a copy of our report of the proceedings when published.

President Smith. I wish to announce that we have received a telegram from New Orleans in regard to our grapes, and Prof. Porter, who is here, will give us an account of our fruit exhibits immediately after the meeting is called together, or immediately after the election of officers this afternoon, and I think there can be nothing of more interest to the members of this society than the professor's statement.

Mr. Sias. I want to say one word in regard to this new paper. I have been very much interested in this paper. I have taken it from the start. I think the first copy was issued about the first of November, 1883, and I have read every copy up to the present time. I think every member should have a copy.

On motion the meeting then adjourned till 2 o'clock P. M.

AFTERNOON SESSION.

THURSDAY, JANUARY 22, 1885.

The meeting was called to order by President Smith at 2 o'clock P. M.

Col. Stevens. Mr. President, in view of the probable change of the commissioner of agriculture at Washington, I would move that this society and the State Amber Cane Association recommend the appointment of ex-Governor Norman J. Colman, of St. Louis, for commissioner.

The motion was adopted.

Prof. Porter was then called upon to give a description of the exhibit at New Orleans.

Prof. Porter then addressed the meeting at some length, giving a description of the New Orleans Exposition, and especially of the Minnesota exhibit. A vote of thanks was tendered him, and he was requested to furnish an article upon this subject for publication.

The report of the Finance Committee was then called for. The following is the report:

Mr. Elliot, from the committee on finance, presented the following report: The finance committee would respectfully report the following: That we have examined the accounts and vouchers of the treasurer, and find the same correct. We have examined the reports of the secretary, and, as far as we are able to determine, the same is correct. We find a greater expenditure of money than the funds of the society will warrant. We fully indorse the suggestions made in the treasurer's report, and recommend that the expenses in the secretary's office be materially curtailed. Respectfully submitted.

WYMAN ELLIOT, Chairman.

On motion of Mr. Whipple the report was accepted and adopted.

QUESTION BOX.

The Question Box was called for, and Mr. Smith read the following question: Are summer meetings of the Minnesota State Horticultural Society a failure?

Prof. Porter. No, sir; they are not. I would rather have one summer meeting than half a dozen winter meetings, conducted as our meeting was two years ago, and as we intended our meeting should be conducted last year, but it failed. We should devote about half of the time in a visit to the vineyards and in experimental work. I tell you that we will learn more by seeing the actual work of the men who come here and tell us how they do it than we will learn in ten times that amount of time by hearing them talk about it. I would rather have one hour in a man's garden than to hear him talk ten hours. That is my reply to the question.

Mr. Smith. I have a proposition for three summer meetings;

one in connection with the Olmsted County Horticultural Society, one at Mankato, and one at Minneapolis. I believe the summer meeting to be the most profitable meeting we have; but I don't think we ought to have it at Minneapolis or St. Paul. I think we ought to have one over at Mankato. They raise lots of fruit there. I was down there, and I found they were raising a great many strawberries and raspberries, apples, and everything of that kind; and we want to wake them up down there—arouse them to action and get them to organize. I don't consider the summer meeting a failure by any means.

President Smith. I would suggest that a vote be taken whether there will be a summer meeting or not.

Mr. Smith. I move that we hold one or more summer meetings.

The motion was unanimously adopted.

Question: Does manuring apple trees prolong their life and usefulness?

Mr. Whipple. I would like to have it understood what constitutes manuring and fertilizing, and the kind of compost?

Mr. Pearce. Mr. President, I think the value in manuring of apple trees depends altogether on the condition of the trees. If a tree is bearing heavily I think it ought to be fed; but if not, it ought not to be so well provided with food.

Mr. Harris. Would you not modify that and say, if it is making a strong growth?

Prof. Porter. It depends upon the amount of nutriment you have for the organic support and growth of the trees.

Mr. Smith. The next question comes from Mr. Outler. He inquires what would be a just and reasonable commission for selling strawberries in St. Paul and Minneapolis.

President Smith. I would state that no commission man can handle and sell perishable fruit and do it safely for less than ten per cent; a man that attempts to do it for less will be very likely to go under or be compelled to make false returns. I do not mean to retail the fruit, but am speaking of the wholesale trade and handling by the case. One cannot do it for less than that and handle the fruit honestly and fairly.

Question: What is the most convenient and economical receptacle for handling and shipping strawberries, and what is the cost thereof?

Mr. Smith. The square quart box I think is the best and of the size for the sixteen quart crate. The cost is four to five

dollars a thousand for box material and ten cents for a sixteen-quart crate and twelve cents for a twenty-four-quart crate.

President Smith. I would recommend the boxes made at St. Joseph, Michigan; they cost three dollars and fifty cents there. For the sixteen-quart crate the cost will be six dollars and fifty cents; the twenty-four-quart will cost eight dollars and fifty cents and ten dollars there at the factory. They give better satisfaction, come cheaper and are very generally adopted by those who handle goods on commission. The best way to handle berries is to let the boxes go with the fruit. This is the square box and it holds a full quart, dry measure. I would move, if in order, that this society recommend and adopt the full quart or dry measure.

Mr. Whipple. I would second that motion. I know there has been a great deal of trouble in years past in getting what is supposed to be a quart; for when you would measure the berries there would be no more than a pint and a half. I am in favor, when we sell a quart of berries, of giving good measure. If we get the Sherman box we get a full quart.

President Smith. You are not certain of that, for they manufacture both kinds, the wine quart and the other size. In sending orders for boxes you should state whether you want the full quart or they will send the wine quart.

Mr. Pearce. Do you mean a full quart inside of the box or outside?

President Smith. They make a box that will hold an exact quart, salt or dry measure.

Mr. Pearce. There are boxes that hold a quart from the outside and the cost is about two dollars and fifty cents a thousand.

Mr. Harris. You have heard the motion that this society recommend and adopt the full quart boxes for the handling of the strawberry crop.

Col. Stevens. Suppose I go into the market and buy two or five quarts of berries, do I not, nine times out of ten, get a full quart of berries?

President Smith. You do in the St. Paul market, for here they make it a finable offense to sell less than the full quart.

Mr. Pearce. What is the weight of a quart of berries?

President Smith. That is a question which it is impossible to answer; the weight varies according to the variety of berries. They give the dimensions in the circulars of the St. Joseph manufactory. I have dealt with them a good many years and

found them prompt in filling orders and gentlemanly in their treatment of customers.

Mr. Tuttle. I have used these boxes for a good many years; have used both kinds. The full quart is a lower box than the others; it has less open space. I find the full quart boxes, when the berries are put up so as to fill them full, will settle down. They don't look as well as when put up in the other boxes, for they heap the berries, putting on all they can lay on, and set the boxes on each other. People would rather see boxes heaping full than not full, but I don't think they get any more fruit than where it is put into the other boxes. I find it the uniform practice, in using boxes of the larger size, not to fill them quite full.

Mr. Harris. I would state that Wells & Co. are manufacturing a box that you want to round up; also we have the wine measure. Dealers will buy by one measure and sell by the other, and in that way will make about every sixth quart.

Mr. Busse. A good many strawberry growers here use the half bushel.

Mr. Harris. I don't approve of selling them in that way for the dealer will always want to make about forty quarts to the bushel.

President Smith. I don't say that the berries put into those boxes are all full quarts, but I believe them to be the nearest to the exact seal measure of anything that we can get; consequently I have no hesitancy in recommending them.

HENNEPIN COUNTY HORTICULTURAL SOCIETY.

Mr. Smith then presented a report from the Hennepin County Horticultural Society.

First annual report of the Hennepin County Horticultural Society, organized February 16, 1884, at Market Hall, Minneapolis. A temporary organization was effected by the election of M. Pearce, chairman; W. H. Brimhall, secretary. At the second meeting a permanent organization as follows:

President — M. Pearce.

Vice President — C. L. Smith.

Secretary — W. H. Brimhall.

Treasurer — H. F. Busse.

Executive Committee — J. S. Gray, G. S. Woolsey, E. M. Chandler, Wm. Lyons, G. H. Roberts.

It was voted to hold meetings every Saturday afternoon during the winter, for reading essays and discussions. These meetings were continued until April 1st, after that the last Saturday of each month during the summer months. The meetings were well attended, and much interest was manifested in the discussions. Valuable papers were contributed by M. Pearce, on the subject of seeds, trees and plants, and on raspberry growing; by C. L. Smith, on shade and ornamental trees, also one on sex in strawberries of hermaphrodite vs. pistillate varieties; by Wm. Lyons, on strawberry growing; by J. T. Grimes, on currants. The membership was forty-six. A fair was held at Market Hall, Minneapolis, September 20, 1884. There were twenty exhibitors, making sixty-eight entries, including over one hundred varieties of apples, twenty-five varieties of grapes, plums, canned berries, etc. One hundred and thirty-nine dollars was paid in premiums. The exhibit was very fine, being a surprise to the visitors; it awakened an interest in fruit growing that we hope to keep alive. Eighteen meetings were held during the year. On December 27th the annual election was held and the following officers elected for the ensuing year:

President — M. Pearce.

Vice President — Ezra Ames.

Secretary — J. E. Northrup.

Treasurer — Prof. L. Asire.

Executive Committee — J. T. Grimes, Wm. Lyons, J. S. Gray, G. H. Roberts, H. F. Busse.

The weekly meetings were resumed the first Saturday in December, and are to be continued every week. The attendance is increasing, much interest is manifested and much practical knowledge gained. The meetings are now held at the seed store of Northrup, Braslan & Co., 22 Bridge Square, these gentlemen furnishing a room warmed and lighted, free of expense to the society. They also keep on file the leading horticultural and agricultural papers of the country for the use of the society.

J. E. NORTHRUP,
Secretary.

M. PEARCE,
President.

[For a more extended report, see Appendix. —SECY.]

The committee appointed to consider the matter of the appointment of an entomologist, etc., presented the following report, which was on motion adopted:

REPORT OF COMMITTEE ON ENTOMOLOGIST.

WHEREAS, The retiring address of President Smith called the attention of the Horticultural Society to the need of an investigation of the insects that are injurious to fruit and fruit trees; and

WHEREAS, The Horticultural Society of Hennepin County has recently recorded its opinion that some authorized investigation of the entomology of the State ought to be undertaken; and

WHEREAS, The Horticultural Society is deeply interested in all that appertains to the protection and propagation of fruit in the State of Minnesota, and is desirous of ascertaining all the facts that have a bearing upon this industry, whether adverse or favorable, and the ways and means of counteracting those adverse, and adopting those that are favorable; and

WHEREAS, It appears from the report of awards lately made at New Orleans that the State of Minnesota, though young in comparison to others in the raising of fruit, has nothing to fear when brought into comparison and competition with the most favored and most famous states of the Union, in respect to the quality of her fruit; therefore,

Resolved, That it is the sense of this society that there should be appointed and maintained, a State entomologist, a resident of the State, who should be authorized and instructed to disseminate useful information to the fruit growers and farmers of the State, respecting the insects injurious to vegetation;

Resolved, That the legislature now in session be requested to make the necessary provision by the enactment of the necessary law to carry out this plan, and by the appropriation of the sum of one thousand dollars per annum for that purpose;

Resolved, That it is the sense of this society that the information desired should emanate from the State University, and that such published information should be as rapidly and cheaply supplied as is possible, with correctness and thoroughness.

Mr. Harris suggested that a copy of the resolutions be placed before the governor or the members of the legislature in order that their attention might be directed to the matter.

Mr. Chas. Hoag. If Prof. Winchell, or some fair-minded man

would be appointed for such a place as that of entomologist it would be one of the noblest things the society could do to recommend him.

Mr. Harris said he would be in favor of the society recommending Prof. Winchell for that position and moved as the sense of the society that Prof. Winchell be authorized to employ an assistant and that he be instructed to prepare a report for our published proceedings. We would give him all the glory he was capable of earning.

Mr. Grimes said he thought the move on the part of Mr. Harris a good one, towards the appointment or election of Prof. Winchell as State entomologist, and thought it would be well as a society to elect him to that position.

Prof. Winchell being present said: Mr. Chairman, if you will permit I will offer a suggestion. I appreciate the courtesy and the honor which has been shown me, but I want to say that while I am acting as the State geologist I do not claim to be an entomologist, and I should, of course, have to decline from assuming to discharge the active duties required of an entomologist; but yet, if in any way the work with which I am connected and the law under which I am working, will allow of it, any assistance that I can render to this society and thus promote the industry of fruit raising in the State, by acting as State entomologist, or in any way, in seeing to the publication of the results which may be secured, I shall be glad to do. But I think that as the resolution now stands before the society it is perhaps a little uncalled for and a little unnecessary, and that perhaps it would be better simply to recommend the appointment of a State entomologist and let it take such course before the Legislature as they may see fit. Let them appoint some other person, or refer them to the Board of Regents to elect a State entomologist; but as such officer I should feel incompetent to serve.

The resolution was adopted.

Prof. Porter. The wording of that resolution will perhaps meet all the wants of the society, at the same time it meets the objections of Prof. Winchell to his personal acceptance. As I understand the wording it does not require Prof. Winchell to perform the work himself, but that he will supervise and it is optional with him to appoint the man that would look after that matter.

Mr. Grimes. We give Prof. Winchell the honor; if he is not capable of carrying the mantle he can drop it onto the shoulders of Prof. Porter.

Prof. Porter. I think he would have no trouble, especially if he is backed up by that State appropriation of one thousand dollars. We can ask this action to be taken.

As I understand it this is a joint meeting of the Horticultural Society and the Amber Cane Association, and I would ask if it would not be proper for a certain number of copies of the proceedings of the meeting to be furnished to the members of the Amber Cane Association, for distribution among the members? I would move that fifty copies of the transactions be furnished to the officers of that organization, to be distributed among their members.

The motion was adopted.

Mr. Harris was then called upon to read a paper upon market gardening and proceeded to read the same. The following is the paper :

MARKET GARDENING.

BY JOHN S. HARRIS.

Farming in some of its forms is the leading and essential occupation of at least one-half of the laboring and producing population of the "Great Northwest," and is the basis of the wealth, power and prosperity of the American people. Whatever lessens its dignity in the minds of the people tends to demoralize the nation, and whatever adds to its dignity makes so much more rapid and certain our advance in national wealth and greatness. It was the original and divinely appointed calling of man which places the farmer before kings and lords, merchants and artizans, soldiers and sailors, and he still feeds them all. We read in Holy Writ that "God planted a garden in Eden," and made it the first man's duty to dress and keep it. When driven from Eden it was still his duty to till the soil and eat his bread in the sweat of his brow. From that time down through every generation to the present, agriculture has been the basis of all progress, and to day the hope of our race hangs upon its prosperity. It is the lever that moves the world.

We often hear it remarked that any man having sufficient muscle is good enough for a farmer, but those who make the remark speak disrespectfully of earth's noblemen and slander their own mother, for the writer, the poet, the craftsman, the miner, the doctor, and the preacher all are creatures of agriculture, and the farmer must feed them all. To do this successfully requires

that the farmer should be a man with brains, and know how to use them. At the beginning God placed the farmer first of all in his creation and if he does not continue to hold that position the great structure of civil society must crumble and fall. To hold the position it is imperative that he shall be thoroughly educated in all the refinements of civilized life and qualified to fill any position in government, art, science or literature, in addition to a thorough knowledge of his calling; and if I mistake not the signs of the times, the time is now at hand when the farmer shall be recognized as the most thoroughly educated of all men.

Market gardening, or as sometimes termed, truck farming, ranks in importance not one step behind any other branch of farming. It is a system of husbandry that will cause the earth to afford more human food from a given quantity of soil than any other, and may be followed by men of limited means who could not successfully engage in stock breeding, dairying or grain raising. Still it affords ample scope for the use of capital. It is the best adapted to the neighborhood of cities and large towns where it in a measure supplies the place of private gardens of individuals who have not land, or are so closely engaged in other pursuits that they cannot well produce their own garden supplies. The locality for the market garden is the better the nearer it is to the city limits; providing the soil is adapted for the purpose, even though the commercial value of the land should be very great. The locality, if not near a city, should at least be near a railroad station, or some other means of quick transportation.

We often hear men who are looking about for some easy and expeditious way of making a fortune, or at least a good living, asking if market gardening is not an easy and lucrative business. We can only reply by quoting the proverb: "The hand of the diligent maketh rich." For the poor man no easy way to success has yet been discovered. The rewards come in, if they come at all, after long days and sometimes years of patient and well-directed toil. The man who may be expected to succeed in it without the backing of capital must be intelligent, persevering, and willing to work, for the business, though pleasant and lighter than ordinary farming, is laborious. By intelligent I do not mean that a man must be thoroughly read in letters and science, although that would be no disadvantage to him; but that he should be quick to comprehend and apt in making application, and he should be

capable of conducting his business in a systematic manner. He should be a close observer, and enterprising enough to keep out of old ruts and avail himself of the advantages of all improvements in methods, implements, seeds, and plants, that come to his knowledge. He should be shrewd in business transactions, but not mean or dishonest, that he may be able to hold the best customers and secure the best prices in the markets for his products. While it is not absolutely essential that he should have served an apprenticeship of several years at the business, he should be capable of directing his help in all of the operations, and have so much of the positive in his management that every employe will expect a prompt discharge whenever he shows a disposition to shirk duty. Such a man, even with but little money capital at his command, will be very likely to succeed, even if not very well acquainted with the business, for he would quickly acquire the requisite knowledge, and if he had capital it would enable him to secure the most desirable location and provide himself with the best seeds and implements. A poor man, or one with limited capital, may, under certain circumstances, succeed at market gardening, if he does not at first attempt too much and get swamped. Every man who contemplates engaging in the business should first weigh well all the circumstances that have a bearing upon it, and if he finds that he can cope with them, he may as safely engage in that as any other occupation. Some of the most essential requisites for success are soil adapted for the purpose, a good and convenient market, and capital enough to provide teams, implements, seeds, etc. The most profitable gardening is a combination of fruits and vegetables. The most profitable productions of the vegetable garden are usually perishable and bulky; therefore the market should be so convenient that it may be reached early in the day, while the fruits and vegetables are fresh and while the consumers are out in search of them. Vegetables coming to the market after the consumers have secured their day's supply, must generally be sold to dealers to hold over for the next day, or to be shipped to distant markets, and as they will calculate upon a large profit and allow for deterioration in value as they grow stale, the producer will realize but little from his sales unless there should be great scarcity in the market. The earliest vegetables of the season usually meet with the most ready sale and bring the highest prices; therefore it is desirable to have the garden in a location where the soil and aspect are favorable for bringing the vegetables

forward most rapidly to the earliest maturity. For a general gardening business a variety of soil is desirable; if but one variety can be secured a deep, dark, sandy loam overlying a subsoil of a porous nature, that soon becomes dry enough to work after heavy rains, is the best. A light land, with sand and gravel subsoil, is not favorable for raising late crops of cabbage, cauliflower and celery, but will do very well for the earliest crops of lettuce, radishes, cucumbers, melons, etc., etc.; and a stiff clay loam with a hard-pan subsoil is exactly the reverse.

The garden site is best, if nearly level, with a slope to the south or east, just sufficient to secure good surface drainage, as such a slope gets the benefit of the most direct rays of the sun in early spring. The garden site ought to be protected from cold winds by hedge, wall, or tight board fence upon the north and west sides. Belts of evergreens, groves of timber, or high walls upon the north side afford good protection. If possible to do so we should avoid selecting soil that is naturally poor, or that has been worn out by excessive cropping, for the reason that soils that have been exhausted of their fertility will at the start require a great outlay for manures and cultivation to restore the fertility. Those naturally poor, although they may be greatly improved by manuring, cannot be relied upon to produce the best quality of crops. But it might be better to locate upon such soils than at too great a distance from the market, for the reasons that it will afford better facilities for selling products, procuring manures and extra help when needed, as well as consuming less time in going to and from the market. For successful gardening the application of fertilizers to the soil is of the utmost importance. For most garden crops the ground will require liberal and frequent manuring; in fact too much manure can hardly be applied for such crops as asparagus, cabbage, cauliflower and celery. Stable or barnyard manure, well decomposed, is the best for general purposes. It is the bank stock which will supply nearly all of the ingredients from which growing vegetables draw their sustenance. The gardener who has a huge pile of it always at hand has deposits in a bank that never fails or suspends payments. Lime, ashes, salt, and every waste from the house or garden have great value as fertilizers, and nothing should be wasted. I never yet have seen a soil so rich that it would not bring a better crop by the judicious use of manure; the kind and quality to be governed by the variety of vegetable to be raised; but an occasional rotation with Peruvian

guano, bone meal, or other commercial fertilizers, has been found beneficial, as also the plowing under of green crops of rye or clover.

Every garden should contain a manure yard or compost heap in or convenient to it, where every kind of waste, with the cleanings of the stable and pig sty, may be composted. To start a compost heap a few loads of horse manure are hauled to some place where there is a depression on the surface, and after fermentation commences the pile is ready to receive additions of every kind of waste that can be secured. There ought to be a substantial fence around it, so that cattle and hogs can be kept in it at times; and the pile should be level on the top, so that water from rains shall not run off; and it is better for tramping and turning occasionally, unless a few hogs are allowed occasionally to root it over. Should the material be coarse it may require wetting down in time of dry weather. The waste hops from breweries and slaughter-house offal are valuable additions to the manure heap. Wherever it can be done the garden should be deeply plowed in the fall after first receiving a liberal dressing of manure, and especially if the soil is somewhat clayey, leaving the surface as uneven as the plow will make it. For the earliest crops some of our best gardeners do not plow again in the spring, but as soon as dry enough and frost is out, scatter fine rotted manure over the surface and harrow down fine and level. For the later crops the ground will be better for plowing again in the spring after the first crop of weeds has started, and I do not think there is any loss in plowing it for the earliest, as it leaves it in a condition to dry out and warm up faster. As a market garden is expected to endure for many years, it is important that the first preparation of the soil should be very thorough. In this country it is cheapest and best done with a team and plow; but in Europe, where labor is cheap it is largely done with a spade, trenching and manuring the whole ground to a depth of two feet. It is a slow and laborious process, and will not likely be soon adopted by Americans. Deep subsoiling is always beneficial, and whenever the subsoil is anyways wet and tenacious, tile draining will enable the ground to be worked earlier in the spring, and insure more certain and better crops.

The gardener should always provide himself with the best implements that can be procured even though the first cost be greater, and have a place to keep them and always see that they are in their place and in the best of repair when not in use. It

is a ruinous policy to allow tools to be dropped and left where last used to rust and rot until wanted again. The indispensable garden tools are a two horse steel plow, a harrow, cultivator, horse or hand wheel hoe, seed drill, Ames' spade and shovel, flat tined spade, fork, manure fork, steel rake, draw and shovel hoes, pronged hoe, wheel harrow, reel and line, watering pot, and market wagon, the first cost of which would not exceed \$300. Another important item is that of seeds. It is not practical for every gardener to raise his own seeds on account of the liability of many varieties to intermix when grown near together on small farms. Of many varieties those grown far north and west will be found superior to all others for earliness of maturity; especially is this the case with lima beans, sweet corn, and tomatoes. My advice would be to raise only such seeds as we have the facilities for growing in the greatest perfection, and purchase the rest of some reliable seed house, patronizing one at home in preference to one no more reliable away from home. Never purchase any seed simply because it is cheaper than others sell the same variety; good seeds bear about the same price everywhere. In raising seed select the best and truest type of the variety to prevent deterioration. Crossing or mixing takes place through the agency of the winds and insects, conveying the pollen when in bloom from one flower to another. It seldom does any injury to the current crop of cucumbers, melons, squashes and such other crops as the seed is produced within the part that is valuable as a food, but the next crop grown from such seed will be worthless. * Corn is affected the same year in which it is crossed and the seeds of cabbage, turnips, and many other plants are nearly worthless when so grown.

To grow vegetables to perfection requires the constant attention of the gardener in keeping the weeds out and the surface of the soil mellow and loose. As the earliest vegetables always command the best prices and meet with the readiest sale it is policy for the market gardener to use every device within his knowledge to hasten the season and be the first in market; especially is this the case with early lettuce, radishes, cucumbers, cabbage, cauliflower and tomatoes. The man who has cucumbers and tomatoes before his neighbor, will often realize more from the sale of a dozen than after a few days from a bushel or hundred.

To secure this end in a climate like ours, glass structures are very essential, and the man who has not the ability to manage

hot beds, cold frames and forcing pits, or the capital to enable him to have them, is placed at a great disadvantage, and if there is much competition in the business, had better engage in some other calling, or locate in some place where there will be no competition, or his market gardening will not be a paying business. In the vicinity of large cities and good markets, it often pays the gardener better to make a specialty of some particular varieties for which his soil and skill are best adapted, and by growing them in the best manner and placing them on sale in the best possible condition, his products will gain a reputation and be eagerly sought for. The gardener whose soil is rather sandy may safely make a specialty of melons, cucumbers and radishes, while if he attempts to grow celery, cauliflower or late cabbage, he may make a failure of them or at best only a partial success and he will very likely lose money in the operation. Finally, it is of great advantage to all gardeners to study well the literature that pertains to their calling, and associate themselves together and frequently discuss the various matters and methods pertaining to their business. There can be no better association for the purpose than a well organized and conducted horticultural society. Such a society affords the gardeners an opportunity for meeting together and comparing notes, and receiving and imparting information in regard to the best varieties of fruits and vegetables, methods of propagation and cultivation, getting them into market; association lightens the hours of toil and improves their social condition.

I have written this paper from the standpoint of a lifelong experience, and am somewhat familiar with every branch of horticulture. If I have done anyone any good, I am thankful. If you desire to hear any more upon the subject at some future time, I am yours to command.

ANNUAL ELECTION OF OFFICERS.

President Smith announced that the next business in order was the election of officers for the ensuing year.

The following list of officers were then elected:

President—Truman M. Smith, St. Paul.

Vice Presidents—Messrs. A. W. Sias, Rochester; F. G. Gould, Excelsior; M. Cutler, Excelsior; G. W. Fuller, Litchfield; and E. H. S. Dartt, Owatonna.

Secretary—S. D. Hillman, Minneapolis.

Treasurer—J. T. Grimes, Minneapolis.

Executive Committee—J. S. Harris, chairman, La Crescent; J. M. Underwood, Lake City; Wyman Elliot, Minneapolis; Ditus Day, Farmington; M. Pearce, Minneapolis.

Librarian—E. A. Cuzner, Minneapolis.

Mr. J. M. Underwood was elected as delegate to the American Pomological Society, which meets in September, 1885, and Mr. J. S. Harris as alternate.

On motion of Mr. Underwood the executive committee were authorized to select any other delegates to fill vacancies and appoint all committees necessary for the ensuing year.

Mr. Harris moved to take up the revision of the fruit lists in the morning, which was adopted.

The meeting then adjourned till evening.

EVENING SESSION.

THURSDAY, JANUARY 22, 1885.

The meeting was called to order at 7 o'clock P. M. by President Smith.

The following communication was received, which was, on motion, ordered embodied in the report of proceedings.

REPORT OF E. B. JORDAN.

ROCHESTER, MINN., Jan. 20, 1885.

Mr. Truman M. Smith, St. Paul, Minn.:

DEAR SIR: Your card received. We marketed about 5,000 quarts strawberries, 25,000 quarts raspberries and about 1,500 bushels of apples. I can not give the amount of grapes as we didn't keep a book account. Respectfully yours,

MRS. E. B. JORDAN.

Mr. Tuttle. Mr. President, I understand that Mr. Jordan is engaged in orange growing in Florida. I was in Chicago a short time ago and I met a gentleman who stated to me that this orange business was being overdone. He spoke of Mr. Jordan, and said he would not be surprised to find that his orchard at Rochester, Minnesota, was much more profitable than his oranges in Florida. Oranges very little more than pay the freight to Chicago; they are sold very cheap and are very plentiful in the markets.

Mr. Harris. I wish to submit a short appendix to the report I made yesterday. I marketed about six tons of grapes from my vineyard last season. I expect to have three acres in bearing next year, and intend to keep on increasing the area until I have five acres planted.

President Smith. Mr. Norquist, of Red Wing, marketed over three tons.

Mr. Harris. I might say here that the grape crop of Minnesota was about 300,000 pounds; and I think over half that quantity was raised in Houston County.

On motion of Mr. Harris, the librarian was directed to furnish one hundred copies of reports for 1884 to the secretary of the State Agricultural Society.

Mr. Whipple stated that he would like to mention what a new member had accomplished in grape raising the past year—Mr. J. J. Cale. He has six acres set in grapes, from which he raised 1,200 pounds of grapes.

The report of the committee on constitution and by-laws being called for, Mr. Underwood presented the report, which was read.

Mr. Underwood stated that the committee had looked up the old constitutions and such by-laws as they could find, and out of the whole had brought together such as was valuable and made such additions as seemed desirable.

The report was received, and, on motion, the proposed articles taken up and adopted *seriatim*.

Mr. Dartt stated that he desired to make some objections to the constitution as a whole. I have the Iowa plan in my head, and expect it will stay with me. I don't want it to crop out often enough to annoy you, but still I believe it is right; hence, on every suitable occasion I feel like defending it. I raise the objection to the whole thing because it is not "Iowa." I will read the Iowa constitution first if you do not object. (Mr. Dartt then read the constitution of Iowa, and continuing, said:) Now, the

point of excellence of this constitution is that, by districting the State, dividing it into fruit districts, and electing a director for each district, which corresponds to a representative in the legislature, we are enabled to spread ourselves over the whole State; there is no section that is not represented. As it is with us here, I think not half the counties of our State are represented. There is a large district in the southwest part of the State that we have hardly ever heard from. Their location is about as favorable as Southern Minnesota generally, and they must be engaged in fruit growing. By this system of electing a director for each district, and paying the expenses of that director as they do in Iowa, we will secure a representative from every one of these districts. We can adopt this plan and take in the whole State, and then I think we may reasonably go before the legislature and ask for what we want and get it. On the other hand, if we ask members of the legislature from the southwest to aid us by an appropriation, they look around and think of their constituents, and ask what do they know about it, or what benefit do they receive? They may get hold of your report and find a recommendation of such varieties of fruits as will grow in the Mississippi Valley. They don't know whether they will grow or not, and very few of the people know of the advantages of the system, which they would know if we had this plan. That is the reason I want this directory system. I want to be able to extend our advantages to the whole State. I think there is no better plan. You may appoint your fruit committees away out there, and fix your experimental stations, and it won't bring them in as this plan will. I don't know as I ought to consume any more of your time.

President Smith. Iowa is so situated that nearly every part of the State is well adapted to fruit.

Mr. Dartt. We probably might not be able to get a report at once from north of Lake Superior. We could take in, perhaps, ten counties. Make the territory along the Mississippi, where your fruit capabilities are about equal, into a district; then put the inland counties as much as possible into fruit districts, so that their climate would be about the same; make about seven districts in the State. These seven directors of those districts, with the president, secretary and treasurer, would constitute the executive board. It gives every part of the State a representation in the system. Under a system where the St. Paul men want to vote, and are allowed to come in and pay a dollar and

become voters, what chance do these outside counties stand with the society composed in that way? If the legislature was governed in that way it would be an easy matter for St. Paul to take possession of the executive chambers whenever they saw fit, and it is about the same with this society. Our society is made up almost entirely of members from Minneapolis and St. Paul; there are a few stragglers from the outside county districts, who stand no show. I would not care for that—I think you are pretty good men down here, I like you for your liberality and on other matters—but I don't think that you can do the good that you could the other way. I want you to spread out over the whole State; we are not working for Minneapolis and the Mississippi Valley, but for the whole State. I move to substitute the Iowa constitution, with a provision for seven directors instead of twelve.

Mr. Underwood. Mr. President, I recognize the importance of our receiving some benefit from friend Dartt's two trips to Iowa; but supposed we had already received our pay, and that it would not be necessary to adopt their constitution in order to get our money back. I think I can show you that we have practically every provision he is asking for, and if I do perhaps something that emanates from our society would be just as valuable as anything that emanates from Iowa. It will be found that only a small part of our membership comes from St. Paul and Minneapolis.

President Smith. About forty members from Minneapolis and St. Paul, out of the 160 to 180 members in the State.

Mr. Dartt. I refer to attending members.

Mr. Underwood. This provision in reference to a board it seems to me is provided for. We have a vice president from each Congressional district; in addition to that a fruit committee from each district, which makes fifteen men in all that are expected to report. Then you have the superintendents of the experimental stations, scattered all over the State, and committees on small fruits and others, scattered over the State. It seems to me that is representation enough; and it seems to me the only thing is to provide for their expenses while here. We can provide for paying the expenses of the vice presidents, the committees on fruits, etc., and then I can see no particular object in the provisions of the Iowa constitution over ours. Our executive committee needs to be so constituted that they can come together without great expense and without too great delay, and

transact necessary business. We have sought in every way to curtail expenses rather than to increase them. Therefore I hope the motion will not be adopted.

Mr. Dartt. I think if we had the directory plan there would be no necessity for a meeting of the executive board during the year. If they have to meet it may be well for them to have it at or near the capital; but it don't suit the mass of the people so well as it does to let them have a finger in the pie. I believe with this other plan you would go before the legislature with a great deal fairer prospect of success than under the present system.

The motion of Mr. Dartt was lost.

Mr. Harris said he had always been in favor of a State board of horticulture.

Mr. Dartt. I am not at all surprised. Men have to allow their moral courage to work up awhile, so they can work in the interest of the whole and throw their own interests aside a little; I expect by another year you men of Minneapolis and St Paul will perhaps get ready to do the outside world justice. If you are I shall be happy. (Laughter.)

Pending the adoption of article eight of the constitution some discussion arose.

Mr. Dartt. In our "Iowa plan" the secretary must hold his office until he shall be able to make his report; I think that is the proper plan.

Mr. Underwood. That was as proposed last winter. It is in article five, where it was provided that he shall compile the annual report of the society. But we looked that over and thought we saw objections to that.

Mr. Dartt. I would give him sixty days to get out his report.

Mr. Smith. I think he should go in for the year.

Mr. Dartt. I do not think we ought to give him any chance at all to get extra pay.

Mr. Underwood. Take it this year; Secretary Gibbs is down at New Orleans. Suppose we were working under this proposed by-law here, and we had to depend on him to get out the annual report; we could not do it. We must depend on Mr. Hillman, our newly elected secretary, to get out that report. This really cuts very little figure any way. He could just as well finish it up as Mr. Gibbs, probably. Mr. Elliot, Mr. Sias and myself have given the matter a good deal of thought.

Mr. Harris. I can see no objection to Mr. Dartt's proposition. Why not let him receive the books the first of April, and the

STATE HORTICULTURAL SOCIETY.

retiring secretary can help us. We want it understood that the secretary's salary commences at the first of April.

Mr. Smith. There is some objection to that. Some think he ought to be continued. But suppose he don't care for the society any longer, and "haggles" out a report. I can see no objection to turning over the books at once, and then the new secretary goes on and gets out the report. Our reports will be got out after the election of the new secretary. I cannot see why a new secretary cannot get out a report as well as an old one. In getting up that report it familiarizes him with the business of the society to a great extent. He knows that is a part of his work. There is that reason for giving the new secretary the work.

Mr. Underwood. That is the reason the committee thought best to give the new secretary the work of getting out the report.

Mr. Smith. I think the new secretary should get out the report.

Mr. Sias. As one of the committee to revise this constitution I must say that I feel the force of Mr. Smith's remarks. When we vote out a secretary it is *prima facie* evidence we don't want him any longer, and don't want him to handle goods for us any longer.

Mr. Dartt. The reasons advanced for turning over the office, I think, are the very ones why he should be retained. The secretary has been running the business right along during the season; he is familiar with all the correspondence and everything that is to go to make up this report, and when everything is in his own mind and in his own hands he can make up a better report himself than a new man. This man, Mr. Hillman, will make a better report a year from now than he could if he had the report to make to-day. There are many things that will come into his possession in the transaction of the business that would help him to make it. That is one of the very best of reasons why he should retain the place long enough to comply with the requirements and make the report. I don't want the members to vote for the thing that is wrong, to beat Iowa.

Mr. Harris. I cannot see any objections, because we certainly should have our eyes open and elect a proper man for secretary.

The article as read was then adopted; also the other articles.

The proposed by-laws were then taken up and considered separately and adopted.*

* For constitution and by-laws as adopted, see page 15 *et seq.*—SEC'Y.

Mr. Harris moved that for the present year, commencing with the close of the present meeting, the salary of the president of the society be twenty-five dollars; that of the secretary four hundred dollars; that of the treasurer twenty-five dollars, and of the librarian ten dollars.

The motion was adopted.

Mr. Dartt said he hoped the secretary would abridge the report as far as was consistent to do so.

Mr. Harris said the secretary should act in harmony, of course, with the other officers.

Mr. Hillman suggested that it was desirable to have a committee upon publication to assist in arranging the subject matter of publication in the forthcoming report of the society.

Mr. Dartt then moved that President Smith, Wyman Elliot and C. L. Smith be constituted a committee on publication and be requested to abridge the report so far as possible, without injury to the value of the same. The motion was adopted.

The meeting then adjourned till morning at 9 o'clock.

MORNING SESSION.

FOURTH DAY—FRIDAY, JANUARY 23, 1885.

The meeting was called to order by President Smith.

A resolution was adopted appointing the following persons a committee to district the State and report at the next annual meeting, to-wit:

Messrs. J. S. Harris, Wyman Elliot and E. H. S. Dartt.

LIBRARIAN'S REPORT.

The librarian then presented his report :

THE COLLEGE OF AGRICULTURE, }
UNIVERSITY OF MINNESOTA, Jan. 20, 1885. }

Mr. O. Gibbs, Jr., Lake City,

DEAR SIR: The following report is an account of the reports on hand at present: 1866-73, cloth 230; 1874, paper 437; 1875, paper 233; 1876, paper 1,050; 1877, paper 361 and 15 in cloth;

1878, paper 153 and in cloth 44; 1879, paper 9 and in cloth 11; 1880, cloth 118; 1881, paper 1,300 and in cloth 300; 1882, paper 1,760 and cloth 620; 1883, paper 154, cloth 1,105; 1884, paper 250, cloth 465.

Yours respectfully,

E. A. CUZNER.

Mr. Grimes moved that the librarian be requested to make a report upon the remaining copies, and publish a list of the volumes now in the library of the society.

Mr. Harris. We ought to know how many copies we will have left. We ought to keep fifty cloth volumes that will not be broken upon. We have only about twenty volumes, all told, of one year.

The motion was amended to accept the report of the librarian and request that it be supplemented with a list of all the books belonging to the society in the library, and adopted.

Mr. Sias presented a communication from A. J. Phillips in regard to prize essays, etc., which was read and elicited some discussion. Mr. Sias moved to refer the "prize essay" to a committee of three, aside from the essay of Mr. Speer. After some discussion the motion was tabled.

REVISION OF FRUIT LIST.

The next order of business was the revision of the fruit list.

Mr. Underwood stated that the committee had never had a meeting and had no report to make.

Mr. Dartt moved to take up the old list and revise it; also that in recommending varieties it be done by vote, and a record be made of the number of votes for and against each variety.

The president said the motion was not in order as it was a part of the standing rules to proceed in that way.

The list of apples, as adopted at the annual meeting in 1882, was then read. A number of changes were made, as will appear below:

APPLES.

For general planting the Duchess was recommended by a vote of nineteen for and none against. Wealthy, twenty-two for; one against.

For planting in limited quantities in Southeastern Minnesota, Tetofsky, fifteen for; two against.

In regard to retaining the Plumb Cider on the list Mr. Tuttle said he could see no reason for its being retained. He would prefer the Wealthy.

Mr. Harris said he had raised good crops, but would not plant them as it was not a reliable bearer.

Mr. Pearce said he would agree with Mr. Tuttle. The Wealthy don't bear every year. He had some trees of the Plumb Cider fifteen years old that bore well; and in favored localities the Plumb Cider was a very good apple. He was opposed to cutting down to one variety. He would recommend planting seventy-five of Wealthy to one of this.

Mr. Harris stated that he had lost more of the Wealthy than of anything else; but he was planting it quite largely, and would continue to do so.

The vote being taken on Plumb Cider, it was stricken from the list by a vote of six for, seven against.

Fameuse stricken from the list; seven for; eight against. St. Lawrence, five for; six against. Walbridge, one for; eight against.

Yellow Transparent was recommended for general trial; ten for; none against.

Mr. Dartt moved that the Peach apple be placed on the list for trial. In his section it seemed to be nearly as hardy as the Duchess. Tree grows well, but so far has been nearly destitute of fruit. If it won't bear it ought to be grubbed out.

Mr. Pearce inquired if they had not better amend the motion by adding "for Steele County."

Mr. Harris. It is a variety that is not well known. I have trees that were purchased from the Jewell nursery, which have always been hardy. They do not bear when young, but for two years past have borne heavily. I like the fruit better than that of the Duchess. The codling moth seems to delight in spoiling the fruit. Of about two barrels of fruit very few specimens were perfect. I believe the tree to be hardier than the Duchess, because when a tree does not bear early it is a good evidence that it is hardy.

Mr. Grimes. My observation, so far as the tree is concerned, is favorable. It stands well. Have trees large enough to bear half a bushel of apples, but have never had more than a few specimens of fruit from them. If they would bear well I would vote for them.

Mr. Underwood. We have been growing it for a good many

years, and for awhile have let it go by default. In the old nursery ground there were some trees left, and they have grown into trees and seem to be perfectly hardy, and bear well every year; not so well as the Duchess or Wealthy, but amply repaying for the ground they occupy. Have gone to propagating them. I should think it would do for Steele County.

Mr. Dartt. If it will do for Steele County it will do for the world.

It was recommended for trial by a vote of eleven for and none against.

On motion of Mr. Sias, Red Anis was recommended for trial; eight for, none against.

Mr. Dartt. I am in favor of putting a goodly number of these Russian varieties on the list for trial. I would recommend the Smelling apple. I had a tree that bore half a bushel of large apples. The tree seems to be hardy and has borne two crops. It grew in Steele County.

Mr. Sias. I saw the fruit at the State fair, and it made a fine show. I will say that I fruited the Smelling apple about ten years ago at my place. I consider it very hardy, a fine, showy apple, and am in favor of putting it on the list for trial.

There were eleven votes for, none against.

Mr. Dartt moved to place the Lieby on the list for trial. He said it was a very hardy tree, more robust in appearance than the Smelling apple; bears nice fruit, not quite so large as the other, seems to be very hardy. He had a tree that had borne two crops.

Mr. Peterson. Here is a sample of the Lieby. I have a tree that is ten years old and it has borne three years. It is a late fall apple and the tree is hardy. It is most as hardy as the Hibernial; all of that family are Russians, and if they do not live, there is no use to plant any trees.

Mr. Sias. I agree with Mr. Peterson. I have fruited the Lieby several years; it bears every year and bears heavily, and is one of the hardiest we have; there is no doubt about that. For a fall apple it is a pretty fair keeper. It is not a very good eating apple, a little too much acid. I would like to hear from Mr. Tuttle; have never fruited it.

Mr. Grimes. I understand in recommending trees for the general public to plant, it is a question we should consider whether these trees can be procured or not for their use; if not we had better make that list pretty short.

President Smith. This is not for general planting.

Mr. Sias. They can get cions if they cannot get trees; I have no trees to sell.

Mr. Grimes. I want to see those valuable Russian varieties brought out as speedily as possible. But I do not want to have the society mislead the public by leading them to believe that the trees can be had when they cannot.

Mr. Underwood. Would you have the society wait until the nurserymen had millions of trees?

The Lieby was adopted for trial by a vote of eleven for, none against.

Mr. Latham moved to place the Swan apple on the list. He said that he had it growing beside the Lieby and the fruit is full as large. It is No. 370 of the Russians. The motion was adopted by a vote of eleven for, none against.

Mr. Pearce moved to recommend the Little Seedling. The motion was adopted, nine for, none against.

Mr. Tuttle. I want to say a word in regard to the Little Seedling; it is one of the best keepers we have found among the Russians. The tree seems to be perfectly hardy and is a great bearer. I find the Little Seedling, or Repka, seems to be a different apple in some hands from that of mine. I think it will be one of the apples that will be worthy of general cultivation.

Mr. Peterson. There is a different kind from Mr. Tuttle's and I don't know as anyone has the Little Seedling but myself. There were samples of it at the meeting last year. The apple that Mr. Tuttle has is a good eating apple, but the one I have is good for cooking and it keeps for a whole year. They are not the same kind that he recommends.

Mr. Smith moved to place the Longfield on the list. He thought it one of the best.

The motion was adopted; fourteen for, none against.

Mr. Sias. I wish to inquire of Mr. Tuttle if he has fruited the Orange Streaked?

Mr. Tuttle. That is a fall apple. There are so many of that class, or of that season, that I think it not best to recommend it. The Hiberna is a good cooking apple; I should select that in preference to almost anything else, for it will grow where anything else will.

The Hiberna was placed on the list for trial by a vote of thirteen for, none against.

SEEDLINGS.

On motion of Mr. Harris the Rollins Pippin was continued for trial, by a vote of eight for, none against.

Mr. Harris moved to place the Excelsior, raised by P. M. Gideon, on the list of seedlings, for trial.

Mr. Pearce. I understand that those varieties of Mr. Gideon's are not to be had as he does not propose to put them out.

Col. Stevens. I will venture to say that Mr. Gideon hasn't an apple on his grounds that he will not give, sell, or dispose of in some way. All the apples he has propagated that are so valuable he has scattered over the whole continent. He has forty or fifty varieties that are hardy; but he would not put them on the public unless satisfied they were perfectly hardy—he is not that kind of a man. It seems to me that not only the Excelsior, but the Gideon and a great many others which he has ought to be recommended.

Mr. Gideon stated that he had published an article in the *Stock, Farm and Home* upon seedlings, which he had desired to have read before the society.

Mr. Harris moved that the article referred to be embodied in the report of proceedings. The motion was adopted.

Mr. Pearce said he desired to ask whether these varieties could be obtained. He had wanted to get cions of Mr. Gideon but had been unable to do so. He would inquire, so there would be no misunderstanding, whether he was prepared to furnish cions or trees of the Excelsior apple.

Mr. Gideon. I will be prepared to furnish trees next fall, but there are no cions furnished this spring. I expect to set about ten thousand root grafts this spring, and of all collections about one hundred thousand.

The motion to place the Excelsior on the list was then withdrawn.

Col. Stevens thought the Elgin Beauty and the Giant Swaar were good varieties to recommend.

Mr. Harris. I think the Giant Swaar is the Northwestern Greening.

Mr. Sias. I don't think it is the same.

Mr. Dartt. It seems to me as many premiums as have been awarded on seedlings we ought to have more than one variety recommended for trial.

Col. Stevens moved to place the Elgin Beauty on the list. The motion was adopted by a vote of ten for, none against.

Mr. Harris moved to place the Giant Swaar on the list. Adopted; eleven for, none against.

Mr. Harris. I will move that proprietors of trees, or varieties, that take premiums on seedlings, be requested to furnish cions to the experimental stations; or that premiums be awarded with the understanding that cions are to be furnished.

Mr. Pearce. I have a seedling from which I have promised cions to some extent. It took a ten dollar premium at the Minneapolis fair. The apple is exceedingly hardy.

Prof. Porter. Permit me to make a brief statement concerning the Experimental Station at the State University. Next spring we shall be prepared for the reception and care of all cions and grafts that may be received. We have not been ready heretofore. I would be very thankful to members of the society if they would send in either cions or root grafts for this spring's use. Anything that they may see fit to send in, properly labeled, will receive proper care and attention, and will be mentioned in the annual report. I shall set every variety of grape that grows above ground in the United States which I can obtain. The first planting I did was two years ago. I have set twenty varieties, of which ten are of the leading varieties, and all are doing well.

Mr. Pearce inquired of the Kimball apple.

Mr. Sias said he had obtained it two or three years ago and it was doing well. He had found them growing on the farm of Mr. David Smith, and looking remarkably vigorous.

Mr. Pearce. There is a tree of this variety in Olmsted County, that is nineteen or twenty years old, which was planted by a lady. It was about ten years old when it came under my observation. The fruit was exhibited at Owatonna one year, and Mr. Seth Kenney and others who saw it on exhibition pronounced it equal to the Rhode Island Greening. I think the apple would be a great benefit to us and would move to place it on the list for trial.

The motion was adopted by a vote of twelve for, none against.

Mr. Tuttle. I should be very glad to furnish any cions or trees, or anything that I have for your experimental stations. I have attended this convention with a great deal of pleasure, and would say that among a body of horticulturists I always feel perfectly at home. I have certainly been made so here, and am

very much gratified at the spirit manifested in the convention. The work that you are doing is not a selfish one; it is for the benefit of the great Northwest. We hope to see, and we trust the time will come when these great prairies will be dotted over with orchards. I firmly believe we may, and with orchards that will grow valuable fruit. I don't believe there is a paradise on earth where there is no fruit. No matter what there may be in the soil, or in the natural surroundings, I believe there is no paradise on this earth, unless it is accompanied with fruit.

I thank you very much for the kindly attentions you have shown me and your reference to our society, and the work we have done in our State. We shall be glad to see any of your members at our convention, which meets two weeks from next Monday, at Madison.

President Smith. On behalf of the members of our society, I will tender the thanks of the society to Mr. Tuttle for the information we have received from him, and his very generous offer to furnish us with specimens for our experimental stations; and we shall be glad to have him meet with us whenever he can arrange to do so.

THE GROWING OF SEEDLING APPLES.

BY PETER M. GIDEON.

Perhaps a few items on the propagating of new varieties of seedling apples would be of interest to many not familiar with the facts or principles governing the production of new varieties from seed; therefore, please indulge me in a short essay on the subject, though in doing it I repeat many items often told, yet new and of interest to the great mass who desire a better collection of fruit, whether they intend to embark in the business or not.

I began the culture of fruit about sixty years ago by planting peach seed. Got a good stand and good growth the first year; then dug, reset and cultivated them myself, and had the pleasure of eating fruit from them before I was nine years old; and ever since it has been my chief calling and delight. But our efforts and trials in Minnesota began thirty years ago last spring by planting one bushel of apple seed, a peck of peach seed, and five hundred apple, pear, plum and cherry trees, and for eleven years thereafter planted each year enough apple seed to bring

1,000 trees, and in the time made frequent additions to the orchard of old named varieties—all Southern or Eastern grown trees and seeds, and all kept as long as they could be made to live in Minnesota, and to-day only two trees remain. One of those, the Wealthy, and grown from a cherry-crab seed, obtained of Albert Emerson, of Bangor, Maine, of whom I obtained cions at the same time, from which I grew the Duchess, Blue Pearmain, and the Cherry-crab, all of which, combined, were the foundation of Minnesota horticulture, that to-day is the pride and hope of the Northwest. But since those varieties came into bearing we have planted only of our own growing of seed, with forty first-class varieties the result. Not all large, but each first-class of its size, and none of the forty less in size than Transcendant or Hyslop, and every one better in quality than those, whilst several will equal, if not surpass, every known popular variety, whether to eat from hand or for culinary purposes.

And now, having given the results thus far of those that have come into bearing, I will state the process by which those results were obtained. The process was, and is yet, the crossing of the common apple with those varieties that had enough Siberian crab in the composition of the tree to make of it what we term an iron-clad, and the process is, by close planting, that wind, bees and other insects can the more readily and surely carry the pollen from bloom to bloom—from one variety to another—so as to fertilize the germ of the fruit, and the seed so fertilized we plant, and when the young trees are large enough to set in orchards, we select the best and then wait to see what the fruit will be; but it is not every seed that will produce a good apple, for no two seeds will be fertilized just alike, hence no two apples just alike, even from seed of the same apple.

From the same lot of seed we grow apples from the size of a large green pea up to the largest size, and of every imaginable form, color and quality, and diverge as widely in form and habit of trees as in fruit; and thus far, of those selected and set in orchards, about one in each fifty has given a first-class apple, and for the reason that our seedlings are a mass of mongrels—mongrel crossed in the mongrel—each, perhaps, of a thousand grades; hence the uncertainty as to what we get. Yet we have demonstrated that out of a great mass we are sure to get something good. The hardness of the crab has to be retained in the tree and size without the astringency of the crab flavor in the fruit, and to judge with any degree of accuracy as to what class

of tree is most likely to combine the sought for good qualities, requires no small amount of careful observation, through a long series of experimenting, and then miss far oftener than hit. When we grew the first from our own growing of seed, we set all in the orchard, and later set in orchard about one-sixth, and yearly, as new seedlings come into bearing, we develop in knowledge, and as we gain knowledge the per cent set in orchards grows less. Thus far it has taken from three to five hundred seedlings to give us one first-class apple, and that from seed taken from the best apples we had; but in the same orchard grew a vast amount of inferior apples, that to a greater or less extent adulterated, hence to some extent the smallness of the gain.

But the conditions in the State orchard are quite different. There nothing but the very best is set, and from it we anticipate a larger percentage of good fruit, though mongrels will cut mighty freaks sometimes in reproduction, and as yet the oldest trees from the State orchard seed are only two years; yet young as they are, many bid fair to give good fruit, and in fact our faith strengthens each year as new varieties come into bearing. But whether I have adopted the best known mode by which to develop new varieties of good quality adapted to our climate, is to note the results, and the result is more first-class apples in the last fifteen years than all other modes put together.

The Siberian cross has given us hardiness of tree, and a combination of qualities not found in any other class of apples, whether to eat from hand or made into sauce—for either use we can match the world, and therefore I hold the Siberian crab to be a godsend to the entire North.

The object of the State orchard is to grow new varieties from seed adapted to our climate, and especially long keepers, and to that end we planted close together in rows, and every alternate tree is a long-keeping variety, and the other alternates are our best iron-clad seedlings—the one to give hardiness and the other long keeping, and in the cross expect to get some combining hardiness of tree and long-keeping fruit of good quality, a treasure we have not yet got, and to get it we top-graft long keepers on hardy seedling stocks that get their growth early and stop their sap flow, thus compelling the later growing, more tender variety on top to harden up for winter, and thereby produce and give us the cross, which could not be done were the long keeper on its own tender, late-growing roots. And even on the best of stocks we find but few long keepers that can be made to stand

and give fruit, and none that are hardy enough to make a permanent tree, and only about twenty out of one hundred bid fair to some day yield fruit—as yet only a few samples have been had from any long keeper. The cross is made in the bloom, the pollen of the iron-clad being infused into the bloom of the long keeper, and the seeds from the long keeper, thus impregnated, are planted, and the young trees that prove hardy and of fair appearance are selected for fruiting.

We have, by careful and repeated plantings, demonstrated to a fact that the seedling will ripen its fruit at or near the time the parent apple did from which the seeds were taken, no matter what crossed with, nor how closely it partakes of the male parent in tree and quality of fruit. In our many trials we have solved the problem what to do and how to do it, and now, with the State orchard set to our notion, we are fairly started on the road to sure success—to make of Minnesota a great fruit-growing State.

The State orchard was set six years ago last spring, with root and crown grafts—no material difference in their growth—and to each was set a stake to mark its location, and at this date have had three crops of apples from it, and the seed of all planted, the last crop being about seventy bushels of the very finest apples. So, taking the success of the past as a criterion for the future, we may reasonably expect not far in the future to number our first-class varieties by hundreds, and in succession the year round. And in conclusion I will just add that many seedlings on our own grounds bore this year (1884) for the first time, and as seedlings do not always prove true to their first crop, we neither name nor send out until after the second fruiting; therefore but few varieties can be had before next fall, at which time we hope to have a full supply of trees of all the best varieties.

Excelsior, Minn., Dec. 20, 1884.

PREMIUMS AWARDED.

Mr. Elliot, from the committee on premiums, reported the following list of premiums awarded by the society at the present meeting:

The committee on the award of premiums on apples, new seedling apples, and grapes, report the following, in their judgment, after a careful inspection and examination of all the fruits on exhibition, as being worthy of consideration:

APPLES.

	PREMIUM.	AM'T.
Collection, A. W. Sias, for A. J. Phillips.....	First	\$ 4 00
Collection, A. W. Sias, for A. J. Phillips. Best in condition.	Second	2 00
Display Wealthy, A. Peterson, Waconia.....	First	4 00
Display Wealthy, M. Pearce, Minneapolis.....	Second	3 00
Display Wealthy, Anna B. Underwood, Lake City.....	Third	3 00
Plate Wealthy, A. W. Latham, Excelsior.....	First	2 00
Plate Wealthy, Andrew Peterson, Waconia.....	Second	1 00
Plate Walbridge, A. J. Phillips.....	First	2 00
Plate Talman Sweet, A. J. Phillips.....	First	2 00
Plate Pewaukee, A. J. Phillips.....	First	2 00
Plate Scott's Winter, Anna B. Underwood.....	First	2 00

RUSSIAN VARIETIES.

Collection, A. Peterson.....	First	5 00
Plate Lieby, No. 240, A. Peterson.....	First	2 00
Plate Hibernial, No. 378, A. Peterson	First	2 00
Plate Ostrekoff's Glass, No. 472, A. Peterson	First	2 00

WINTER SEEDLINGS.

Plate Seedling No. 1, G. S. Woolsey, Minneapolis.....	First	2 00
Plate Seedling, F. K. Phoenix, Delavan, Wis.....	Second	1 00

NOTE—Woolsey Seedlings, Nos. 1 and 2, produced in five years from seed of the Wealthy, is a fact worthy of notice from your committee; and if a history of the hardiness of the trees, with soil, location, exposure, habit of growth, and whether transplanted, would be furnished for publication it would be of benefit to the members of the society. No. 1, the smaller of the two varieties, in our judgment, will prove the best and largest keeping variety; a good culinary apple. No. 2, the largest, is a fall apple, inferior to its parent, with nothing to recommend it but size and possibly hardiness of tree.

The exhibition of Peter M. Gideon, of beautifully arranged plate pictures of his new seedlings, is worthy of a passing notice, and if the fruit, as far as possible, could have been placed on exhibition, it would have added much interest to his exhibit, and it is hoped he may be able in future to do so, giving us a chance to judge of their merits, than on paper. We voice the desire of all present that Mr. Gideon furnish a short description, as to hardiness, season, quality, etc., for publication.

GRAPES.

The largest number of varieties placed on exhibition, by Truman M. Smith, of St. Paul, consisting of fourteen named varieties. We especially commend them to your notice for their splendid condition so late in the season. A list of them, named in the order of their keeping qualities, with the method of handling and keeping, should be furnished our secretary for publication. Eumelan shows good keeping qualities, and if placed in cold storage will be a fine flavored variety for winter use:

	PREMIUM.	AM'T.
Ionia, T. M. Smith, St. Paul.....	First	\$5 00
Collection and Condition, T. M. Smith.....	First	2 00
Eumelan, J. A. Kernan, Young America.....	First	2 00
Agawam (Rodgers No. 15), T. M. Smith.....	Second	2 00

SEEDLING GRAPES.

A new seedling grape from S. S. Washman, of Lake City, presents a good appearance, keeping quality good, bunch medium in size, skin thin, pulp melting and fine flavor. If a history of this new favorite could be furnished, stating its parentage, hardiness, productiveness, etc., we would be in favor of recommending a premium.

VEGETABLES.

	PREMIUM.	AM'T.
Hubbard Squash, H. F. Busse, Minneapolis.....	First	\$ 75
Early Potatoes, H. F. Busse, Minneapolis.....	First	2 00
Winter and Spring Potatoes, C. H. Whipple, Northome.....	First	2 00
Winter and Spring Potatoes, W. H. Brimhall, St. Paul.....	Second	1 00
Collection Onions, J. J. Cale, Minnetonka.....	First	1 00
Collection Onions, H. F. Busse, Minneapolis.....	Second	50
Collection Field and Garden Seeds, 60 varieties, E. Webster.	First	6 00
Same, Northrup, Braslan & Co, Minneapolis, 51 varieties...	Second	3 00

PANTRY STORES.

	PREMIUM.	AM'T.
Strawberry Jelly, Mrs. T. M. Smith, St. Paul.....	First	\$1 00
Currant Jelly, Mrs. T. M. Smith, St. Paul	First	1 00
Rhubarb Jelly, Mrs. T. M. Smith, St. Paul.....	First	1 00

On motion the meeting then adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

FRIDAY, JANUARY 23, 1885.

The meeting was called to order at 2 o'clock P. M. by President Smith.

On motion of Mr. Pearce the premium list of last year was adopted.

On motion of Mr. Dartt the treasurer was authorized to borrow a sufficient amount of funds from the permanent fund to pay all current expenses of the year.

On motion the list of hybrids was then taken up for revision.

CRAB APPLES.

The list as adopted in the year 1882 was taken up. (See page 103.)

Mr. Dartt said he was not sure that Beach's Sweet was hardy. If anyone knew that they had borne well he would be willing to retain it.

Mr. Pearce. Beach's Sweet is apparently hardy and a good grower; as it gets older it is a heavy bearer and none could have any objections to the fruit.

Beach's Sweet was adopted; five for, and none against.

Orange adopted; six for, one against.

Early Strawberry adopted; five for, one against.

Whitney No 20, adopted; four for, none against.

Mr. Sias stated that he was the first to introduce Powers' Red. It came from Flushing, N. Y.; had proven perfectly hardy, a great bearer and a fine pie apple.

Powers' Red was stricken from the list, also Minnesota.

For planting in limited quantities Virginia and Hyslop. The latter adopted by a vote of ten.

Col. Stevens. I would like to say that the Hyslop, while I don't think the fruit is as good as the Transcendent, has become celebrated in our market, and is in demand, as valuable for making jelly. It makes jelly of a peculiar flavor and exceeding richness in color.

Hutchinson's Sweet was stricken from the list.

. GRAPES.

Mr. Smith moved to recommend the Concord for general planting.

Mr. Latham. There is no objection to that, but there should be a modification. It is the latest we have on our list for general planting. I would amend by adding, in favored localities.

The motion was lost; five for, six against.

Mr. Smith's motion adopted by a vote of thirteen for, none against.

Delaware adopted; fifteen for, none against.

Moore's Early was substituted for Janesville by a vote of eight for, three against.

Mr. Chas. Ludluff. The Miles grape is very fine. The Hartford Prolific is very early. Moore's Early is a poor bearer on my place; bunches not large but the berries are very large. It is a good grape, but not a good bearer. I don't call it first quality; we have many a good deal better. The Delaware is the sweetest and the best; the Lady is very early, and I think it is the finest grape we have.

The Lady was stricken from the list for planting in limited quantities.

Mr. Gideon considered the Brighton as one of the best, and favored placing it on the general list.

Prof. Porter. The Brighton I regard as one of the very best of grapes we have grown, in vigor of vine, productiveness and quality. I have vines that are nearly two years old. I judge of its adaptation to our Minnesota climate by the growth made in the last two years, growing with nineteen other varieties; they have made the most vigorous growth of any. They ripen their vines early and come out in the spring in splendid condition. I would vote to place it on the general list.

Mr. Latham. I have observed it closely. I believe I give my vines as good care as anyone; the ground is not fertilized in any way so as to force them or induce any disease, to which vines are liable from that or from over-cultivation. I have the Brighton in two places in my vineyard, and in both places the fruit has mildewed and rotted more or less. It is a good bearer and produces handsome bunches; but as compared with Moore's Early, or even Lady, I could not vote to place upon the general list, from the fact of its blighting, rotting and mildewing. I have no trouble with any other varieties in that way except the Ionia. It ripens a little earlier than the Concord; it is safe around Lake Minnetonka.

Mr. Gideon. We have a good many vines of the Brighton; we never had them rot until this last season, when a good share of our crop was destroyed. But there was certainly nothing that came nearer escaping than the Brighton. The Ionia was cut into very heavily, and one other rotted badly. The Brighton was much better than the Concord with us and made as good, healthy growth as any on the premises. The Concord and Isabella were pretty near entirely killed out.

Mr. Ludluff. I must say the same as Mr. Gideon. The Brighton keeps sound on my place.

The Worden was adopted for general cultivation; eight for and none against.

For planting in limited quantities, Rodgers No. 15; nine for, none against.

President Smith. I would suggest that Rodgers No. 9 has proved to be the best of the whole of them.

Mr. Ludluff. Rodgers No. 44 is better.

Mr. Gideon moved to place Rodgers No. 9 on the list for general cultivation.

Adopted; ten for, none against.

President Smith. The grapes sent to St. Paul from the vineyard at Red Wing are about the finest that come to this market. The Lady and Moore's Early are excellent, but not as hardy and vigorous vines as I would like. Lady is a good fruit, sells well, but the vines are not as vigorous as they ought to be. They are fair bearers.

Mr. Ludluff. I recommend the Martha for an early grape; it has bunches like the Delaware. Think it would make a good market grape.

President Smith. There have been a good many of them shipped from below; but they don't sell well. I have had it in fruit some eight or ten years. We have others that I think are much finer. I would give more for one pound of Lady than for three of Martha, for my use or to sell.

Mr. Ludluff moved to place the Martha on the list for trial. Adopted; ten for, none against.

President Smith. Rodgers No. 44 is a good variety. I have always had to trim them, but I have never lost a Rodgers grape in any way. I would not be without No. 44. I would state that by pruning the Rodgers back that I got more and better fruit. I can succeed well with it by pruning, and prefer it to the Concord. Trim on the Cleveland plan.

On motion of Mr. Gilpatrick, Rodgers No. 44 was placed on the list for trial. Eight for, one against.

Mr. Gideon. The Elvira is a very good grape to plant. The bunches are very compact; grapes a greenish white.

Mr. Ludluff moved to recommend Kramer's seedling for trial.

President Smith said it was an excellent grape, and was originated by Mr. Kramer, of La Crescent.

Motion adopted; six for; none against.

On motion of Col. Stevens it was decided to hold the next annual meeting at the Agricultural Hall, State University, Minneapolis.

Col. Stevens, from the committee on final resolutions, presented the following report, which was adopted by a rising vote:

FINAL RESOLUTIONS.

The committee on final resolutions would respectfully report as follows:

That the thanks of the Minnesota State Horticultural Society and the Minnesota State Amber Cane Association, at their annual meeting in joint convention assembled, are due and are hereby tendered to the Chamber of Commerce and to the citizens of St. Paul for the generous entertainment of the members during the session; making our sojourn in the beautiful capital city pleasant and agreeable. That our thanks are also due to the St. Paul, Minneapolis & Manitoba; the Chicago, Milwaukee & St. Paul; the Chicago, St. Paul & Omaha; Chicago & Northwestern; the Minneapolis & St. Louis; the Northern Pacific and the St. Paul & Duluth railroads, for rebates from regular passenger fare; to the editors and reporters of the daily newspapers in this city and in Minneapolis, for full and copious reports of our deliberations; to William King, of St. Paul, for the magnificent display of flowers; to Gov. Hubbard, for the use of the hall which we find so comfortable and convenient for meetings of a public character, and finally we wish to congratulate the members upon the favorable auspices which has attended their labors on the present occasion, and we venture to predict that the future labors of the two organizations will be fraught with much moment to the whole Northwest.

Respectfully submitted,

JOHN H. STEVENS,

JOHN S. HARRIS,

EDWARD D. PORTER.

SUMMER MEETING.

Mr. H. F. Busse called attention to the matter of fixing a location for the summer meeting and moved that it be held at Minneapolis.

Col. Stevens said he wished to see the meeting held at the experimental farm.

Mr. Smith said the meeting might be held, perhaps, at the Coliseum at Minneapolis.

Mr. Dartt. It seems to me that it is all right to go to Minneapolis next winter, but we should go there with the understanding that under favorable conditions we should meet here again the following winter.

Col. Stevens. That is the understanding.

Mr. Smith. We want three summer meetings.

President Smith. That can be left with the executive committee.

Mr. Dartt. I object. The executive committee is a creature of this society. There are good arguments in favor of having the summer meeting when small fruits are in a condition to exhibit. But if we have one meeting it seems to me that is sufficient for the small fruit growers. People don't like to expend their money and time in order to attend a sort of jubilee, as I understand these meetings are usually sought to be made; at least I got the impression from the report last year that the meeting was of that character. They came together and had strawberries and cream and had a good time. That is all very nice and I want them to have it.

The motion was amended that the summer meeting be held at Minneapolis at a time and place to be designated by the executive committee, and adopted.

RASPBERRIES.

The raspberry list was then taken up. For general planting the following were recommended:

Doolittle; nine votes for, none against.

Seneca; seven for, three against.

Mammoth Cluster; seven for, three against.

Gregg; five for, one against.

A member asked why there was any opposition to the Gregg.

Col. Stevens. I have seen that variety growing in Olmsted and Rice counties.

Mr. Smith. Who was growing them in Rice County?

Col. Stevens. I saw them growing at Morristown.

Mr. Smith. I have had many persons tell me they had them, and when I came to examine them, found they had the Seneca Blackcaps. Orders are often filled with the Seneca.

Mr. Gideon. I got mine from a nursery in St. Louis, and part of them from Ohio. I would remark here, that we planted a patch which faced to the south, in a very warm situation, and the canes killed back in the winter: we grew a patch on a northern exposure, and they did amazingly well.

Mr. Latham. I planted some of the Gregg Blackcaps several years ago, in parallel rows with the Doolittle, which have done well with me for fifteen years. They made a good growth the first year; the next year they killed down to the snow, and we have picked, perhaps, a pint of berries from a row one hundred and fifty feet long. The next year they were killed entirely, and I think I had the genuine Gregg.

Mr. Whipple. I know of at least ten persons who have the Gregg on the banks of Minnetonka. It is a large, showy berry, but not as good as the Doolittle. It needs different cultivation to succeed well, and my experience is that we cannot raise as much fruit from it as from the Doolittle, and not nearly so good; but still we can raise a showy berry that will outsell the Doolittle in the market, by the quart.

Turner was adopted; ten for, none against.

Philadelphia, adopted; eight for, three against.

Cuthbert, adopted; thirteen for, none against.

President Smith said the plants of the Hansell were too high, but they might recommend it for trial.

CURRENTS.

Red. Red Dutch, adopted; eleven for, none against.

Victoria, adopted; eight for, none against.

White. White Grape, adopted; nine for, none against.

Black. Black Naples, adopted; three for, two against.

Fortrial, Stewart's Seedling, adopted; eleven for, none against.

Sias' Seedling, adopted; two for, none against.

Prince Albert, adopted; nine for, none against.

GOOSEBERRIES.

American Seedling, adopted; ten for, none against.

Downing's Improved, adopted; thirteen for, none against.

NATIVE PLUMS.

For general planting, Harrison's Peach, adopted; nine for, none against.

Forest Garden, adopted; six for, one against.

Weaver, adopted; five for, none against.

De Soto, adopted; eight for, none against.

Mr. Sias moved to recommend the Rollingsone for trial. It is a native, raised by O. M. Lord, of Minnesota City.

Adopted; nine for, none against.

Mr. Sias. The Rollingsone has been sent out under the name of Minnesota Plum, by H. M. Thompson, of St. Francis; I have it from Mr. Thompson himself that it is one and the same thing.

STRAWBERRIES.

For general cultivation. Wilson's Albany seedling, adopted; ten for, none against.

Mr. Ford said he had the best success with Charles Downing. On light sandy soil I did not succeed very well.

Mr. Smith. It should be borne in mind that berries that succeed well on clay will do hardly anything in sand. On heavy black soil the roots will be large.

Charles Downing, adopted; six for, none against.

Downer's Prolific, adopted; five for, none against.

Green Prolific, adopted; three for, two against.

Crescent Seedling, adopted; nine for, one against.

Mr. Whipple. The Capt. Jack succeeds in some localities, but with me, if you would bring me 10,000 plants I would not give ten cents for them; it smothers out. They are nice looking berries. The hulls are left on the vines; you can't ship them in good shape.

President Smith. With me it is as profitable as anything else.

Mr. Ford. On Mr. T. M. Metcalf's Northwestern Seed Farm, at White Bear, Capt. Jack has done about the best of anything.

Capt. Jack, adopted; five for, two against.

Mr. Ford. Windsor Chief I think is the finest strawberry I

have ever raised without any exception. I set a thousand plants. I move to put it on the list for trial.

Adopted; five for, none against.

Cumberland Triumph, adopted for general trial; three for, none against.

Miner's Prolific, adopted; four for, none against.

For trial, Bidwell, adopted; five for, none against.

Iowa Prolific, adopted; five for, none against.

Minnetonka Chief, adopted; seven for, none against.

Manchester, adopted; seven for, none against.

James Vick, adopted; seven for, none against.

Old Iron Clad, adopted; six for, none against.

BLACKBERRIES.

Stone's Hardy, adopted; seven for, none against.

Ancient Briton, adopted; seven for, none against.

FRUIT LISTS.

The following is a recapitulation of fruit lists as adopted:

APPLES.

For general cultivation—Duchess, Wealthy.

For planting in limited quantities in special locations—Tetofsky.

For general trial—Yellow Transparent, Peach Apple, Red Anis, Smelling Apple, Lieby, Swan, Little Seedling, Longfield, Hibernial.

SEEDLING APPLES.

For trial—Rollins' Pippin, Elgin Beauty, Giant Swaar, Kimball.

CRAB APPLES.

For general planting—Beach's Sweet, Orange, Early Strawberry, Whitney No. 20.

For planting in limited quantities—Virginia, Hyslop.

GRAPES.

For general planting—Concord, Delaware, Moore's Early, Worden.

For planting in limited quantities—Rodger's No. 15, Rodger's No. 9, Martha, Rodger's No. 44, Kramer's Seedling.

STRAWBERRIES.

For general cultivation—Wilson's Albany Seedling, Charles Downing, Downer's Prolific, Green Prolific, Crescent Seedling, Capt. Jack, Windsor Chief, Cumberland Triumph, Miner's Prolific.

For trial—Bidwell, Iowa Prolific, Minnetonka Chief, Manchester, James Vick, Old Iron Clad.

RASPBERRIES.

Blackcaps; for general planting—Doolittle, Seneca, Mammoth Cluster, Gregg.

Reds—Turner, Philadelphia, Cuthbert.

BLACKBERRIES.

Stone's Hardy, Ancient Briton.

CURRANTS.

Red—Red Dutch, Victoria.

White—White Grape.

Black—Black Naples.

For trial—Stewart's Seedling, Sias' Seedling, Prince Albert.

GOOSEBERRIES.

American Seedling, Downing's Improved.

NATIVE PLUMS.

For general planting—Harrison's Peach, Forest Garden, Weaver, De Soto.

For trial—Rollingstone.

There being no further business before the meeting, on motion adjourned.

MEETING OF THE EXECUTIVE COMMITTEE.

A meeting of the executive committee was held at 2 o'clock P. M., January 23, 1885, all the members of the committee being present, to-wit:

Messrs. Harris, Underwood, Elliot, Day and Pearce.

The following bills were audited and ordered paid:

Two hundred railroad return tickets.....	\$1 50
Two hundred plates, furnished for winter meeting.....	2 00
A. W. Sias, expenses on seedling committee.....	10 00
Mrs. Tillson, expenses and preparing essay.....	7 50
C. L. Smith, services as assistant secretary, \$5; printing and postage, \$10.75.....	15 75
President T. M. Smith, postage and incidentals.....	10 00
J. M. Underwood, executive committee, meeting and postage.....	5 00
Total.....	\$51 70

The following committees were appointed for the ensuing year:

Committee on Seedling Fruits — J. S. Harris, La Crescent.

Committee on Nomenclature — A. W. Sias, Rochester; E. H. S. Dartt, Owatonna; Wyman Elliot, Minneapolis.

Committee on Forestry — S. M. Emery, Lake City; F. G. Gould, Excelsior; M. Cutler, Sumter.

Committee on Fruit Blossoms — C. W. Hall, Minneapolis; George P. Pepper, Pewaukee, Wis.; M. Pearce, Minneapolis.

Committee on Russian Apples — A. G. Tuttle, Baraboo, Wis.; A. W. Sias, Rochester; Andrew Peterson, Waconia.

Committee on Vegetable Gardening — Knight H. Whipple, Northome; Fred. Busch, Richfield; W. H. Brimhall, St. Paul.

Committee on Small Fruit. — Prof. L. Asire, Minneapolis; O. M. Lord, Minnesota City; Isaac Gilpatrick, Minneapolis.

Committee on Floriculture. — Mrs. C. O. Van Cleve, Minneapolis; Mrs. A. Morse, Minneapolis; Mrs. J. F. Rodgers, Lake City.

General Fruit Committee. — Sidney Corp, Hammond; D. K.

Miechenor, Etna; Charles Brendermule, Moorhead; C. E. Shannon, Granite Falls; O. F. Norwood, Balatine, Lyon County; M. C. Bunnell, Newport; J. N. Stubbs, Long Lake; George S. Barnes, Fargo, Dak.; William McHenry, St. Charles; O. M. Lord, Minnesota City; Clarence Wedge, Albert Lea; E. Meyer, St. Peter; M. Cutler, Sumter; G. W. Fuller, Litchfield; L. E. Day, Farmington; Charles Ludluff, Carver; W. E. Brimhall, St. Paul.

It was decided to leave the list of superintendents of experimental stations of last year unchanged.

Mr. Harris stated that he would conduct the business of the committee on seedling fruits without expense to the society.

On motion the secretary was instructed to write to the superintendents of the experimental stations and ascertain if they are conducting the experiments in accordance with the proposed plan under which the system was established; if not, to report to the executive committee.

On motion Wyman Elliot and Secretary Hillman were appointed a committee to prepare and address a circular letter to leading horticulturists throughout the State to ascertain the condition of fruit and fruit prospects in the State, etc.

It was suggested by Mr. Isaac Gilpatrick that a premium of five dollars be offered on the largest amount of strawberries grown on four square rods of ground, contributors to give character of soil, variety grown, mode of cultivation, etc. Also the same for raspberries.

The meeting then adjourned.

SECRETARY'S PORTFOLIO.

DEFERRED PAPERS, REPORTS, APPENDIX, NOTES, EXTRACTS,
ETC.

INTRODUCTORY NOTE BY THE SECRETARY.

The following pages have been prepared for publication in addition to the transactions of the society, containing a number of papers, extracts, suggestions, and information of more or less interest, not properly belonging to the routine report.

Owing to a press of other duties we have not had as much time at our disposal as was desirable for the arrangement and preparation of the subject matter of the present volume for publication. Our acknowledgments are due to those who have kindly contributed to this department of the work. We regret that lack of space precludes the giving place to several interesting papers and other miscellaneous matter, of value and interest to horticulturists, more particularly several contributions to the reports of kindred societies in neighboring states; but these volumes are within the reach of those who desire to obtain them. To attempt to embody within the present volume any considerable portion of the discussions and interesting information to be gleaned therefrom would be impracticable, however desirable such an undertaking might seem to be.

Horticulture is a science, the study and advancement of which is well worthy of emulation; it has reference to the comfort, the beauty and the refinement of home and its environments, conducing to the promotion of the enjoyments, the pleasures, and the real luxuries of civilized life. Of an æsthetic nature, it promotes refinement in the family circle, as shown in the cultivation of beautiful plants and lovely flowers; tending to the adorn-

ment of home and its surroundings. It teaches the best and most approved methods for the embellishment of both city and rural homes, made pleasing and attractive by the propagation, culture and care of fruit, shade and ornamental trees, shrubs, plants, vines, and flowers. In short, it embraces a wide field for investigation, study and labor, and affords its votaries ample and lasting reward for all well directed effort. Horticultural work is at once pleasing, elevating and delightful, and the possibilities to be accomplished almost unlimited.

The Minnesota State Horticultural Society, as its name implies, is comprehensive in its objects, plans and purposes. The objects of the society are aptly set forth in its constitution as being "to improve the condition of pomology, horticulture and arboriculture, by collecting and disseminating correct information concerning the culture of such fruits, flowers, trees, and other productions in horticulture as are adapted to the soil and climate of Minnesota."

Originally designed and organized as a fruit growers' association, we find upon examining the record of its early work and history, that the organization has since greatly widened its scope and general character; that it has measureably extended its power and influence; that its roll of membership has steadily increased from year to year in numbers; and the organization now includes within its ranks very many of the most thoroughly efficient, active, and earnest workers to be found in the varied branches of horticultural labor within the limits of the State and in the Northwest. It will be apparent to the most casual observer that the society has made this encouraging growth and progress, that it occupies an advanced and meritorious position as an organization, and that it aims to benefit not only the fruit growers of the land, but to seek out, foster and encourage the best and most advantageous methods to be followed in all departments of horticulture. That such should be its mission no one will gainsay or deny. Its officers and members recognize the obligations which seem almost imperatively imposed; most cheerfully, too, would they discharge their several duties, and seek to place it on a plane of usefulness, where it shall be a means for good, establishing for itself a character which shall give it strength and power, and wield an influence which commands respect and gains the confidence of all.

The rewards bestowed on well directed horticultural industry and toil are numerous and varied; the mere suggestion carries

with it glowing pictures of possibilities to be found within the realm of Nature and her gifts; it clothes the home with all the loveliness of spring, adorns, beautifies, and fills the land with all the luxury of choicest fruits and flowers. What fields are opened for investigation; what varied conditions to be studied, learned, and practiced: what changeful climate; how much depend on heat and cold, seed time and harvest, selection and care, rain and drought, machinery, markets, protection from insects, culture, economy, and skill! All these and many other things must be considered within the realm of horticultural knowledge and investigation.

It is the aim within the limits of the present volume to give a somewhat brief and at the same time faithful outline of the work, transactions, plans and purposes of the associations whose reports are found herein contained: to group in a convenient form for ready reference, such other information as we may, that all who scan its pages in present or in future time, may find some food for thought, some facts of value, the whole to constitute a work to be esteemed of use, and worthy to be given to a friend.

We would enlist in this important work the humble cottager, the sturdy farmer, the skillful artisan, the busy merchant, the thoughtful student, all of every character and calling, to join hands with us in earnest effort to advocate, sustain and push our worthy cause. Especially do we invite our lady friends to join us in our work and teach us by their skill, their well known love for all that's beautiful and true, to emulate examples of the useful and the good, and gain that plaudit of success which finds expression in the words "well done."

"I know not which I love the most,
Nor which the comeliest shows,
The timid, bashful Violet,
Or the royal-hearted Rose;

"The Pansy in her purple dress,
The Pink with cheek of red,
Or the faint, fair Heliotrope, who hangs,
Like a bashful maid, her head.

"For I love and prize you one and all,
From the least low bloom of spring
To the Lily fair, whose clothes outshine
The raiment of a king."

ENTOMOLOGIST'S REPORT.

BY R. J. MENDENHALL.

Mr. President and Gentlemen of the Horticultural Society:

While highly appreciating the honor you have conferred upon me by naming me your entomologist, I feel it my duty to the society and to myself to tender—with the few accompanying notes on insects—my resignation of the position. I do this with reluctance, for if I had leisure and strength for the work, although not considered a meddlesome man, nothing would give me greater pleasure than to spend my days “peeking and prying into the ways and manners” of our six-legged inhabitants, and to wage a war—allowable even for a Quaker—against the flying and crawling armies that come up every year to take possession of the products of our toil and care. I should delight to report to you annually of all these things, to warn you when a new enemy was approaching our borders and to suggest the best methods of defense against those already in ambush among us; but poor health and a pressure of other business make the necessary observations and experiments impossible for me.

About a year ago (February, 1884), while in pursuit of health and recreation in Mexico, I kept my eyes open for the tropical insects of which we read such wonderful accounts, and was rather surprised at their scarcity. It was not the season for the full flutter of insect life, but, considering the high temperature and the luxuriance of vegetation, it seemed strange that so very few species should be on the wing.

In Vera Cruz I took a *Papilio*, resembling our *P. asterias*, except that the under wings, instead of being ornamented with blue and yellow, were almost entirely of a deep red color, making it a very characteristic and beautiful species. I also collected near the city of Mexico a lot of cocoons from a tree called by the natives the Wild Olive, which had been almost stripped of its leaves by the caterpillars. The cocoons were about the size and shape of those of our *Attacus cecropia*. On my return home I left them with an entomological friend in Kirkwood, Mo. When the moths developed I was informed that they were the rare and beautiful *Attacus cinctus*, Tepper, a semi-tropical species which had been first discovered and described less than a

year before, by a Brooklyn, N. Y., entomologist, who found them in Southern Arizona. The moth is similar in size, form and general color to the cecropia. The extended wings measure about five inches from tip to tip, and each one is ornamented in the centre with a large, transparent, triangular spot. A white band crosses the body just back of the thorax and extends laterally around the abdomen.

If your entomologist had only gone to Mexico a year sooner he might have been the first to find this magnificent insect. Except certain unpleasant domestic pests these were the only insects met with. Beetles were still in winter quarters and so secluded that it was impossible to ferret them out.

But I turn to the insects in which we have a more practical interest. In the summer of 1881, the Linden or Basswood trees all around Minneapolis were attacked in force by a leaf-rolling larva that had never been seen here before. Its ravages were so serious on some trees as not only to greatly disfigure them and check their growth, but to actually endanger their lives, and there was scarcely a tree that was not more or less infested. The leaves were slit first across from one edge beyond the mid vein and then in a curve toward the tip but not quite severed. This part was neatly rolled into the form of a cone-shaped bag fastened with bands of silk to keep it in shape and had both ends neatly tucked in. The mischief maker could be found, on unrolling this odd little case, securely housed in the centre, engaged in dining on the inner walls of his house. He was a pea-green, stout, worm-like fellow with jet black head, collar and thoracic legs. When he had gained his full size he drew a part of his case closer around him, lined it with silk and changed to a slender brown chrysalis.

I neglected to gather any of these cases early in August and when I did collect later in the month, all the moths had escaped. A large proportion of the pupae had evidently been destroyed by parasites. The work of the latter, aided perhaps by climatic conditions, must have been unusually thorough, for during the following summer I could not discover a single rolled leaf even on the trees that were most abundantly infested the year before. Nor did any appear in 1883, but last summer they were again on hand in moderate numbers.

In the fall of '82 Prof. Fernald discovered what is undoubtedly the same insect on the Basswoods around Bangor, Maine, and he was fortunate enough to get the moth which proved to be a

pyralid, *Pantographa limitata* Grote. As I have never seen the moth I cannot describe its appearance, but the stage in which it commits its depredations on our shade trees is the one in which we are most interested and of that I have already given an account. There are probably two broods in a season, the second of which winters over in the rolled leaves, and, should the insect ever become statedly troublesome, the best way of reducing its numbers would be to rake up and burn the fallen leaves of infested trees late in the fall.

Among the various leaf folders and small web worms that infest the apple tree, one called the apple leaf sewer (*Phoxopteria nubeculana*, Clem.) has no doubt already attracted the attention of our orchardists. The larva of this species is a small roughened caterpillar half an inch long and about a tenth of an inch in diameter, of a dull green color, with a pale brown head and collar and the surface sprinkled with brown horny dots from each of which arises a pale, shining hair. This larva folds the leaf lengthwise with the upper surface inside and feeds upon the green tissue principally near the outer edges. It makes its appearance in July, and when full grown lines the inside of its case with silk and becomes dormant. The folded leaves fall to the ground in due season, but the little caterpillars within them come to no harm, and when spring returns they change to slender, brown chrysalides, from which the moths issue in May and June—the chrysalis having previously forced itself through and partly out of the case.

The moth is a handsome Tortrix measuring nearly an inch across the extended wings, which are of a milk white color, beautifully ornamented with pale and dark brown spots and shadings. There seems to be but one distinct brood of this species in a season; but it is so irregular in its development, the moths coming out a few at a time and not laying their eggs all at once, that one may find larvæ of all sizes and leaves freshly folded as well as others dry and skeletonized, from July to September.

In some orchards in Northern Illinois and Wisconsin last year almost every third leaf was folded, to the great disfigurement of the trees. This species, like the Basswood leaf rollers, may be kept in check by gathering and burning the leaves before the snow falls.

There is but little new to report concerning the common orchard pests, such as the canker worm, the tent caterpillars, the

fall web worm, the round-headed and flat-headed borers, the bark louse and the codling moth, except that some new ways of fighting them have been tried with more or less success. The kerosene emulsions with milk or soap are coming more and more into use, their principal recommendation being that they are less dangerous to man and the higher animals than Paris green, and are equally deadly in their effects on the "bugs." The only difficulty is to get the oil so strongly mixed with the dilutants that it does not fall in "splashes" on any part of the plant. For use on large trees a force pump is necessary for its application, and this also keeps the fluids well stirred. A tree syringe answers very well for small trees and other plants. For use on leaf-feeding insects a ten per cent mixture is strong enough, but for scale insects a larger proportion of kerosene may be used, and in all cases it must first be thoroughly emulsified with at least an equal quantity of milk or strong soapsuds, and the water added later. Before concluding I wish to say a word on the *aphis*. This is an insect that "we have always with us" in one form or another. Scientific entomologists have described a great number of species, and make much of the differences between them, which they find in the way a vein in the wings curves here in one, or branches off there in another, or is entirely wanting in a third; whether the honey tubes are long or short, or whether the skin is covered with cottony or waxy secretions, or is smooth and polished. The main points of structure in which the horticulturist and farmer are interested are the *beaks* with which they abstract such large quantities of the sap that was prepared for the nourishment of leaf and blossom and fruit, and that they multiply at a rate beyond any "arithmetical progression" for which we can find rules in books.

Most of the so-called "scab" on apples is undoubtedly due to punctures and exudations of the common apple tree plant louse (*aphis mali*). This insect hatches with the unfolding of the buds in the spring, and swarms on the tender leaves. All the lice hatched in the spring are agamic females which, in about a week, begin to reproduce themselves, not by the usual and slower process of laying eggs, but by a plan analogous to the propagation of plants by buds and slips, by which the young lice are brought forth alive and about half grown. In the course of a day or two these are also adding to the population in the same way, and it will be evident that in a very short time a single *aphis* will be the original parent of an immense colony. Each louse, as soon

as safely on its feet, plunges its beak into the leaf or branch on which it finds itself, and begins pumping up sap with all its strength. It is never satiated, and only withdraws its beak for a brief interval two or three times, when it molts its skin, or to seek a fresher leaf if the one first attacked becomes too dry.

Nature provides against its being gorged with the sweet juices by furnishing it with two little tubes or outlets on the back, through which the superfluous fluids exude in the form of "honey dew." This very shortly turns black and moulds, while the punctures of the insects distort the tender twigs and cause the leaves to curl and wither, so that a badly infested tree is a most unsightly object. That sound, well-flavored fruit will be produced on a tree under such circumstances is not to be expected. Wherever the young apples are punctured by the aphides, or are spattered with honey dew, the skin becomes rough and warty, and the form and flavor of the fruit is proportionately impaired.

Toward the end of summer the true male and female aphides are developed, and the latter, instead of producing living young, lay large numbers of eggs. These are very minute and of a shining, black color, and are placed in the cracks of the bark on the trunk and large branches. By means of these eggs the species is perpetuated through the winter. The best preventive, therefore, against the attacks of this pest is to have all the outer loose bark scraped from the trees, and have them thoroughly washed with strong soapsuds or whitewashed. This should be done during mild days in winter, or very early in spring. Many hibernating enemies of the fruit and foliage, besides these plant lice, will also be exterminated by these measures.

When the aphides appear in the spring they can be cleaned off by a thorough dusting with air-slacked lime and Pyrethrum powder, or by the use of a small quantity of Paris green in liquid suspension.

All plant lice have a great many natural enemies, which, even without artificial remedies, greatly reduce their numbers in the course of the season, but they often do irreparable damage before the lady-birds and syrphus flies make their appearance in effective numbers.

The history of this aphid is in the main the history of most of the species that attack cultivated plants, although different measures have to be employed for destroying them.

In his last report, Prof. Forbes, the State entomologist of Illinois, describes several species that had proved very injurious

of late years to sorghum. One of these was the corn plant louse (*Aphis maidis*), a bluish green or lead-colored species, which works just as it does on corn, on the opening leaves and tassels, and did considerable damage, but a far more injurious species was one that had not been previously described, a bright yellow plant louse, with rows of black points on the back, which works on the older leaves, stalks and roots. Two or three other kinds attack various parts of the plant, but are not so destructive. All these lice have the usual natural enemies, but Prof. Forbes was not able to suggest any practicable artificial remedy except the lime and superphosphate fertilizers.

FRUIT PROSPECTS IN SPRING OF 1885.

During the latter part of March, circulars of inquiry were sent out to leading horticulturists and others, for the purpose of obtaining information concerning the effect of the severe winter upon fruit trees, shrubs, plants, vines, etc., and the outlook for fruit the present season. Replies have been received from a number of persons which are herewith appended. The spring being quite backward it was not expected that as accurate and satisfactory reports could be had as might otherwise have been obtained, but it was thought that the effect of the extreme cold weather might be seen more especially in the orchards and nurseries. The reports received are not encouraging, but on the whole not as gloomy as was to be expected. The circular referred to was as follows:

CIRCULAR LETTER.

MINNEAPOLIS, MINN., March, 1885.

DEAR SIR: In view of the interest taken in orcharding and horticultural pursuits in Minnesota and throughout the Northwest, as manifest at the late annual meeting of the Minnesota State Horticultural Society, its executive committee, at that meeting, appointed the undersigned a committee to prepare and address a circular letter to leading horticulturists and others interested in these pursuits, asking for such information as they might be able to give upon these subjects.

The past winter has been one of remarkable severity and much anxiety has been felt upon the part of horticulturists concerning the condition of fruit trees, shrubs and plants, especially in unfavorable situations. Careful examinations are requested, of trees in orchard or nursery, in order that reliable data may be obtained.

Please answer the following questions and to the point, and return as promptly

as possible, in order that the information elicited may appear in the forthcoming report of the society.

1. How has the past winter affected standard varieties of apples?
2. What varieties, if any, have received no injury?
3. What varieties have sustained least injury?
4. Describe the character of the injury.
5. What is the condition of Russian varieties in your locality?
6. Have you, or do you know of any that have withstood the past winter without injury?
7. What is the condition of Siberians and hybrids?
8. Have you, or do you know of any seedling, or unknown variety of apples which has come through the winter unharmed, or which promises to be of value? If so, state section, township and range, age, locality, with description of fruit, etc.
9. State character of soil, exposure and what protection, if any, to trees.
10. What is the present condition of strawberries, raspberries, currants, blackberries and grapes? Is the prospect favorable for a good crop of fruit?

WYMAN ELLIOT,
S. D. HILLMAN,
Committee.

Please answer the foregoing as far as practicable and forward to the secretary of the society.

S. D. HILLMAN,
Minneapolis, Minn.

FROM PETER M. GIDEON, SUPERINTENDENT EXPERIMENTAL FRUIT FARM.

EXCELSIOR, MINN., March 28, 1885.

All varieties of apples and crabs are discolored more or less, but the extent of the damage cannot be told as yet. By next fall we can tell what varieties have the inherent vitality to recover from the shock, and until then I don't propose to commit myself for or against anything.

The following article from the pen of Mr. Gideon will be found of interest in this connection.

DAMAGE TO FRUIT TREES.

Editor Farm, Stock and Home:

I have been out to-day examining the apple prospects for the coming season, and am sorry to say that the prospect is anything but flattering. The damage far exceeded that of any winter since we first began the cultivation of the Crab, Duchess and Wealthy. Never before did they discolor so bad, or come so near losing their entire crop of fruit buds. All varieties are discolored more or less in their last year's growth, though many of them

had gone through twenty winters unharmed, showing this to be the hardest on fruit trees ever had. Not that the winter was the coldest, for we have had colder, and no damage done the trees. Evidently it was the condition in which the trees went into winter with sap up. They ripened up early and shed a part of their leaves; then came a warmer spell, started the sap, revived the remaining leaves and swelled the fruit buds almost to bloom—too far out to stand any degree of cold—consequently on many varieties all fruit buds are dead, and a prospect of a short crop on the balance. But as yet we can't determine the full extent of the damage, the inherent vitality in each variety to surmount the shock hold their fruit and outgrow the discoloring; but by next fall we can tell quite correctly what varieties can stand best to have winter close in on them with their sap up; or, in other words, which variety has the most Siberian crab in its composition of tree, for it is the crab nature that carries through when winter catches the sap up. With us the young Wealthy trees stood full as good as the best of the Russians, side by side, same age and size of tree, and all showed more or less damage. The Russian pears all killed—my last hope gone of pear culture in Minnesota.

PETER M. GIDEON.

State Fruit Farm, Minn., March 17.

FROM CLARENCE WEDGE.

ALBERT LEA, Minn., March 26, 1885.

Not being an expert I cannot thus early in the season ascertain accurately what damage the past winter has done to the fruit of any kind; but the Duchess, Wealthy, Tetofsky and Elgin Beauty appear to be substantially uninjured. Some terminal buds on rank growths of Wealthy are killed, and Rollins Pippin are seriously injured. My grapes are not yet uncovered. The Worden, Moore's Early, Cottage and Concord ripened their wood well last fall and I expect to see them come out well this spring. The Telegraph and Prentiss were caught by the frosts with very immature wood, and although in the same soil and situation as the above mentioned varieties, I fear they were badly injured.

FROM RED RIVER VALLEY.

MOORHEAD, MINN., April 9, 1885.

Your circular letter of March 26th last duly received. Did not answer at once in order to see effect produced by warmer temperature after the severe winter's freezing on stocks. Before answering your inquiries would first make a general statement. I have tried a number of apple trees, planted when three to four years old and procured from different nurseries in Minnesota. I cannot now remember all the varieties I experimented with but am positive of having tried the following: Emperor, Alexander, Tetofsky, Duchess, Walbridge, Haas, General Grant, Soulard Crab, Whitney No. 20, Beach's Sweet, Sylvan's Sweet, Wealthy, Minnesota, Hyslop and Transcendent. The following all died during the first winter and summer following first winter after planting: Alexander, Walbridge, Haas, General Grant, Soulard and Minnesota. Badly injured: Tetofsky, Duchess and Wealthy. Injured some: Whitney No. 20, Beach's Sweet, Sylvan's Sweet and Hyslop. Never injured by winter only for the last two years by blight: Transcendent. But of the plantings of years ago none ever bore fruit or revive now except Transcendents. Finding experimenting with two to four year old trees too expensive to judge by experience had, I commenced with root grafts of the following: Whitney No. 20, Wealthy, Beach's Sweet and Sylvan's Sweet. The first year's growth all got winter killed. In the spring I cut off dead wood and those that made a new growth, nearly all winter killed the following winter; that is, most of the trees and nearly all the summer's growth; Wealthy the most so. Pruned down dead wood again of the remaining trees, and they made a fine growth that summer. Dug all the remaining trees out in the fall and buried them; planted again in spring of 1884. All made a fine growth last summer but attaining only a height on the average of from two to four feet; left them out over winter. Examined them to-day and find that last summer's growth and some of summer before buried killed in Wealthy; Whitney No. 20, Beach's Sweet and Sylvan's Sweet, new growths of last summer about half dead. About a dozen Transcendents of same age and same treatment, sound to the tips.

Will now answer circular letter by numbers.

1. Have none except noted before.

2. Have none except noted before.
3. Have none except noted before.
4. Have none except noted before.
5. Do not know of any in this part of State.
6. Do not know of any in this part of State.
7. None proved entirely hardy but Transcendent. Do not know of any Siberian crabs alive around here now.

8. Have two seedling crabs; received them among Transcendents years ago for Hyslop; bore fruit now for three years; apples small and very acid. Color, light yellow green. The next is a larger apple, shape more regular, color white waxy. Have planted seeds of both and would like to know if the stock might prove of value for top grafting; it will do for rootgrafting; trees perfectly hardy, more so if possible than Transcendent (T. 142, R. 48,) age twelve years.

9. Deep black loam. Exposure southeast. Protected on south by planted timberbelt 50 feet wide; on west and north by Red river and belt of timber in bottom along its banks.

10. Raspberries have only succeeded with the native ones, indigenous here. Currants all right and prospects for crop very good. Strawberries, too soon to tell about. No Grapes to my knowledge, of cultivated sorts here. Have given up long ago to attempt any further trials. Imported Blackberries last spring but have not uncovered them yet, covered them with earth last fall knowing by former experience that they winterkill here.

FROM R. L. COTTERELL.

DOVER, OLMTED COUNTY, MINN., March 28, 1885.

I acknowledge the receipt of your circular. I am sorry that I cannot give you the desired information; I wish I could. I am anxious to read all I can relative to the subject. I have not been able, from the examination I have given my trees thus far, to arrive at any definite conclusion.

FROM M. CUTLER.

SUMTER, MINN., March 31, 1885.

Wealthy badly used up; Duchess injured some. Whitney No. 20 seems to be all right, and Transcendent in pretty fair shape;

new growth killed back some. Strawberries injured some. Think there will be a fair crop of berries if the season is favorable. Turner and Cuthbert raspberries injured some; cannot tell how badly until growth commences. Currants seem to be all right. The Snyder, Taylor's Prolific and Stone's Hardy blackberries are badly injured. I look for a light crop of fruit this year.

FROM PRESIDENT T. M. SMITH.

ST. PAUL, MINN., April 3, 1885.

In answer to questions in circular of inquiry, would say that my orchard shows considerable injury from the severe winter. Wealthy badly discolored; Duchess not so much. Have two or three Russian varieties that appear to be uninjured, even to the terminal buds. Where the bark is discolored it is difficult to say the exact extent of the injury; am of opinion the trees will recover. Have not examined other orchards. Mine is on northern exposure, on high land, with no protection to trees. Strawberries covered with wheat straw and all right; covering not yet removed. My raspberries were hurt some, especially Cuthbert and most of the blacks. Hansell and Crimson Beauty appear to be hardy; Henrietta killed to the snow line. Currants uninjured. Grapes are well covered and unable to report on them. Think the prospect for small fruit as good as usual, but the apple crop likely to be less, although it is rather early to determine with any degree of certainty.

FROM J. S. HARRIS, OF LA CRESCENT.

LA CRESCENT, MINN., March 31, 1885.

I am making an examination of the trees in my orchard, and noting the visible effects of the last winter upon the same, find

1—That nearly all varieties of the standard apples have sustained injury from the severity of the past winter.

2—The injury to Duchess, Tetofsky, Peach, Wealthy, and McMahon's White is only a slight discoloration of the ends of the twigs of last year's growth, that were forced by the pleasant weather of last autumn to make a new start after regular growth had ceased, and will not materially affect the vitality of the trees.

3—Haas, Talman Sweet, Utter, and Willow Twig are in-

jured in twig, and occasionally in the axils of the branches, but will probably recover and fruit again; Walbridge is not very much hurt in the branches, but shows bark burst in the trunks. St. Lawrence is not very badly injured except in very old trees. Fameuse, Plum Cider, Ben Davis, Perry Russet, and most other varieties are apparently used up.

4—In no instance do I discover any injury to the roots.

5—There are but few of the newer Russians growing here; their condition is about the same as the Duchess and Tetofsky, except that I find the Red and Yellow Anis, and two other varieties not known, show no injury.

6—Of Siberians and hybrids, Transcendent, Early Strawberry, Pride of Minneapolis, and Whitney No. 20 are all right. Most others that I am growing show some discoloring in ends of the twigs. Maiden's Blush and General Grant seriously injured.

7—Seedlings that I have been looking after are some distance from here, and I have not time to visit them at present; will report later. Trees of Rollins Pippin, and Giant Swaar, procured from A. W. Sias, of Rochester, promise well.

8—The soil of my orchard is chiefly sandy loam to clay loam; southern and eastern exposure, protected on north and west by high bluffs and forest; no special protection has been given; snow has been deep and ground unfrozen.

9—Strawberries have wintered well; currants the same; so have native plums; Blackcap raspberries injured above the snow line, Turner and Cuthbert at the tips.

Grapes, where dropped to the ground, all right. Two vines of Moore's Early that were left up appear uninjured. Blackberries all killed except where covered.

The prospect is favorable for an average crop of strawberries, currants and grapes; present indications point to a light crop of apples. I have a few apple trees on a northern exposure that appear better than those on the southern.

FROM WM. FORSTER.

CHATFIELD, MINN., March 31, 1885.

Have a few hybrids and Siberians; do not see as they are hurt. Also my standards and seedlings. It has been a very severe winter, but the sudden changes are what hurts our trees, and there was very little of such weather this winter. I have some of my seedling apples yet in the cellar, and they are keeping well. They are the Forster Red Winter.

FROM S. BARTER, OF GREEN LAKE COUNTY, WIS.

MARKESAN, April 4, 1885.

In answer to your ten questions in circular letter of March, 1885, I would state that it is early in the season to give a correct answer as to the injurious effects of the past severe winter on fruit trees, etc. My impression is, that shrubs and trees that are not iron-clad in their hardiness, have suffered materially. I have a Flemish Beauty pear tree that has grown well for two summers; now I think it is dead, as the wood is black. The Duchess, Wealthy, Tetofsky, Wolf River, and the Siberians are all right. I think the strawberries, blackberries, grapes and rose bushes that have had straw protection are all safe and sound.

FROM GEO. P. PEFFER.

PEWAUKEE, Wis., April 20, 1885.

In answer to your circular of last month I will say:

1—Trees with healthy foliage of our recommended varieties are not much injured, but those suffering from mildew, or lacking in foliage during the summer, either from hail or by caterpillars, are hurt badly, and some are entirely killed. (See list in our transactions.)

2—I only answer from examination in my own orchard; have examined none others.

10—Small fruits seem all right. Native and some of the Lombard plums all right. Buds killed some on cherries, but trees not hurt.

5—They seem good.

6—Tetofsky, Yellow Transparent, Duchess, etc., all good.

8—I. B. Smith's seedling, a handsome, new variety, which kept perfectly well and yet on our tables at New Orleans; trees not injured in the least. Dougherty, a seedling from Green Bay, Wis., also a good keeper, but do not know anything of the tree.

FROM JOHN P. ANDREWS.

FARIBAULT, MINN., April 11, 1885.

In answer to your questions:

1 and 2. All standard apples examined show more or less injury.

3. Duchess, Wealthy and Tetofsky have sustained the least injury.

4. Wood is discolored above snow line.

5. Better than most common standards.

6. No.

7. Beach's Sweet, Early Strawberry, Virginia, Whitney No. 20, Orange, Maiden's Blush, and Minnesota look very well. These, with Duchess, Wealthy and Tetofsky, will probably overcome their injuries enough to make profitable trees.

8. Have examined none but what have the last year's growth discolored.

9. Clay subsoil; a little sand in soil; elevated location; no protection.

10. Grapes covered, think all right; strawberries, where covered, are good; currants in good shape; raspberries and blackberries injured to the snow line; Turner seems to stand it best of the raspberries. A poor prospect for a good crop of fruit this year. Plums look very well.

P. S.—Inclosed find membership fee to Horticultural Society.

FROM FREMONT, WISCONSIN.

W. A. Springer, of Fremont, Wis., under date of April 3d, writes: I have spent to-day in several orchards to be able to answer your questions.

1. The past winter has injured almost all our standard varieties, in that the ends of the cions are colored; some more and some less. The Snow, Russet, Haas, Walbridge, Fall Orange, Winter Red, Plum Cider, Pewaukee, and many others, one-half or more of the cions badly colored or dead; Culvert, Ben Davis, Maiden Blush, and some other cions, all dead, and the bark on large limbs and trunk discolored, also the wood. Many trees will never leave out.

2. I know of no variety of the standard sorts that have not received some injury to the ends of cions.

3. The Duchess, Tetofsky, Fall Orange, Wolf River, and Wealthy, if they may be called standard, are very little injured.

4. Have already described injury.

5. Have few Russians; Duchess, Tetofsky, and Alexander, very little injured.

6. I do not know of a bearing standard tree that some of the cions are not injured.

7. Not a bud of the Transcendent injured; Hyslop a little colored; Whitney No. 20 is good; Lake's Winter all right; and the Calendar (new) is all right; the longest of any all winter, good and handsome, a seedling of Mathews' Russet and Web's Winter Crab.

8. I have to-day visited the seedling orchard of Mawhinney, of Lind, town twenty-one, range twelve, east, and find the Lind, Mawhinney, Baxter, Walla Walla, Garfield Sweet, Lagon's Sweet, and Helen, very little injured. These are from seed of Alexander, except Helen, which is a very large and showy apple, good quality and took first premium at our fair. The Mawhinney, Helen, and Lind are all winter.

I have also visited the Wrightman orchard and find the Wrightman Blush, Waupaca, Martha, Weyauwega, and Alden very little colored in the ends of cions; his Flora and Wrightman more discolored. Find also the Mathews' Russet and the Rich Greening very little injured. And I have not found a tree of the new apples I have spoken of injured to any extent. I visited and cut cions from Manning's Red, a nice, large, conical, red apple; just a bud or two of the ends of the cions were colored. These latter are all winter except Waupaca and Martha, which keep to mid winter.

9. The standard trees I have tried in most every soil from sand to clay, exposed and also with slight protection. The Mawhinney orchard is nearly on a level, on gravelly loam, with no protection; the Wrightman orchard has a west protection of native oaks, is a large orchard, and slopes quite heavily to the south, which I regard as the worst kind of protection; the land is very stony, with large boulders and bunch grass growing on the land in its original state. The Mathews, Wilson's Sweet, and Rich's Greening are on the same kind of soil, but sloping a trifle to the north, with no protection except from surrounding orchard.

10. Strawberries are all right where there was snow. Raspberries were badly injured above the snow line. Blackberries that were laid down are all right. Grapes are covered yet and all right.

We have many new varieties of apples in this county that are large, attractive, and good, but I have not had time to see them all. The prospect is not good for a large crop of apples.

FROM A. W. SIAS.

ROCHESTER, MINN., April 13, 1885.

In reply to your circular letter, calling for a report on the condition of our trees, after the past severe winter, will say: This action of our society in sending these circulars all over the State, asking if there is a *single variety* that has passed through the past unprecedented cold winter without injury, is very commendable. It shows an honest purpose on the part of the society to guard the people against the fraudulent transactions of certain tree brokers, tree dealers and tree peddlers who are trying to flood the State with such semi-hardy worthless varieties as the Mann apple, Alexander, Northern Spy and many others. It shows that the society, like Patrick Henry, is "willing to know the whole truth, to know the worst and to provide for it." Believing this to be the spirit and honest intent of the circular, I take my spade, pruning shears, microscope, etc., and go out to-day with the determination to probe to the root and heart of the whole subject. First I examine the foundation of my trees, because without live roots no plant can thrive; but thanks to an abundance of the beautiful snow our roots are all right. Next I take my pruning shears, and finding a branch that crosses and interferes with its neighbors I clip it out close down to the trunk of the tree, in order to get one, two and three year old wood. I cut up the different year's growths and put them under the microscope, also the fruit buds. This I do in all parts of the orchard, with the hardiest and tenderest sorts, and now I am prepared to answer questions.

1. "How has the past winter affected standard varieties of apples?" Answer—Like man, none are found absolutely perfect.

2. "What varieties, if any, have received no injury?" Answer—Every variety of the common apple and of crab apple are more or less discolored.

No. 3. "What varieties have sustained least injury?" Answer—Our friend R. L. Cotterell examined the Brett seedlings for us and sent us wood of the past year's growth of each, and judging from this would suppose they were all among the very best, but cannot speak positively in regard to them, as we have not seen the older wood. The next varieties which received but slight discoloration were the Russian Green, Lieby, Enormous, Tetofsky Type, McMahan White, Sweet Jennette, Giant Swaar,

Autumn Streaked, Revel Pear, Duchess, Tetofsky, Wealthy, Rollins Pippin, Elgin Beauty, Rollins Russet, Longfield, Yellow Transparent, White Transparent, Green and Red Transparent, Philips' Sweet and Sour Seedlings, Wolf River and others.

4. "Describe the character of the injury." First, as a rule, the fruit buds are killed; second, much of the wood is so discolored by the extreme low temperature of the past winter that too large a proportion of it will be converted into heart wood.

5. "What is the condition of Russian varieties in your locality?" Answer—They average a trifle better than American sorts.

6. "Have you, or do you know of any that have withstood the past winter without injury?" Answer—No.

7. "What is the condition of Siberians and hybrids?" Answer—They have withstood the effects of the past severe winter better than all others, but none have escaped *some* discoloration.

8. "Have you, or do you know of any seedling, or unknown variety of apples, which has come through the winter unharmed, or which promises to be of value? If so, state section, township and range, age, locality, with description of fruit, etc." Answer—Were I obliged to answer the above by yes or no, I should say no; but I think, perhaps, the Hart apple comes as near filling the above bill of requirements as anything with which I am acquainted. It is supposed to be a seedling of the Talman Sweet, fertilized by the Duchess, and originated in the township of Dover, Olmsted County, Minnesota.

9. "State character of soil, exposure and what protection, if any to trees." Answer—Clay loam soil, high, northern exposure, and mostly surrounded by evergreens.

10. "What is the present condition of strawberries, raspberries, currants, blackberries, and grapes?" Answer—All O. K. and prospects for a good crop of fruit.

Providing the bark of a tree is alive, it is *truly wonderful* to see how small an amount of sap wood is actually necessary for its welfare and support. The idea that a "black-hearted" tree is *worthless* is about played out. I never had a stronger *abiding faith* in successful fruit culture in Minnesota than I have to-day, notwithstanding the fact that our trees will increase in heart wood this year more rapidly than ever before. We shall watch *hopefully* for the "survival of the fittest," grasp these with *confidence* and *thankfulness*, and proceed to astonish the croakers in the future as we have in the past, both at Phila-

delphia and New Orleans. *Faith*, accompanied by good works, in our pleasant vocation, will work wonders for the good of the State.

FROM PROF. J. L. BUDD, SECRETARY IOWA STATE
HORTICULTURAL SOCIETY.

AMES, IOWA, April, 1885.

On the dark colored soil of Iowa we have had the most trying tests of fruit yet known. Absolutely no wood is sound except of the Siberian and Russian sorts. Fameuse, Gros Pomme and even Wealthy are lowered in vitality, but the latter is quite as hardy as the coast sorts of the Russians. The interior varieties of the Russians are as perfect, and in many cases more perfect, than Duchess. I am specially pleased with the varieties of the interior parts of Russia, where dent corn ripens, say of Varenesh, Orel and Kursk. They are fully as hardy as Duchess and high in quality. I received a letter from an old settler at Lake Minnetonka that his Wealthy were killed. It was a very gloomy letter indeed.

FROM N. J. STUBBS.

LONG LAKE, MINN., April 24, 1885.

If my views in relation to fruit prospects are desired, as indicated by circular, I will gladly give them. My observations have been somewhat limited, but generally small fruits, such as strawberries, currants, and grapes have come out in splendid condition, and unless late frosts should catch them in their bloom we may expect a full crop. Raspberries that have been properly cultivated and trained the last summer are also in good condition. The Gregg for blackcaps are grown almost exclusively in this section, and have given very good satisfaction generally, especially where grown on sandy soil, it seems better adapted for this than clay or very black loam, and this is certainly a very valuable, large, and very late raspberry. For reds, the Turner and Cuthbert seem to be the varieties here; the former, I think, will bear off the palm as the ironclad raspberry, and it is a very good berry for home use. The Cuthbert is only about one-half hardy, will not be a success without winter protection. But on account of its large and delicious scarlet berries, and its long seasons of fruiting, ordinarily running through six weeks or till

first of September, it will be planted more or less and pay well for the extra care or work of covering with soil.

But as to apple trees I think it impossible for anyone yet to fully determine the full extent of damage done them the past winter. But I must say there is no variety of standard, hybrid or crab that I have examined but what the wood is very dark. Of the crabs I think the Whitney No. 20 has come out best, and is really the best crab yet produced, and of the two standard varieties the Duchess are in the best condition. We cannot, under the present condition of things look for much of a fruit crop in the way of apples this year. I have noticed orchards that were located on northern exposure or slope are damaged the least; and trees that were heavily mulched and not cultivated are less colored, facts going to prove that the greatest damage done to fruit trees is usually caused by the sap rising late in the autumn and the weather turning suddenly cold, when with so much moisture in the cells of the wood it bursts them. This is no theory of my own, but is a fact proved by scientific experience; hence we need not be seriously discouraged if our loss is serious, for we can the better meet those conditions in the future, that are so destructive to fruit trees and ward them off. We have no Russian varieties in this vicinity that I have examined; hence I could not state in regard to their condition generally. I do not know of any seedlings of promise, but what are seriously affected in this town.

FROM E. DE BELL, SIOUX FALLS, DAKOTA.

Under date of April 14th, Mr. De Bell, president of the Dakota Horticultural Society, writes: "The wood of the Antonooka apple is in perfect condition; not colored in the least. Salome very badly colored.

FROM C. H. HOFFNER.

LITCHFIELD, MINN., April 26, 1885.

Your kind favor received and noted. I am very busy now, delivering, consequently cannot make a full report. Transcendant, Hyslop, Minnesota, Stewart's seedling, and Duchess came through all right; but the Wealthy and a few other varieties are more or less damaged.

This has been the hardest winter I have ever known since I

have been in the State. Small fruits are all right. My black walnuts came through O. K., although they made a vigorous growth and were unprotected. Am sorry I cannot make out a full report, but I will join your society soon and lend all the aid I can to such a society, in my weak way.

FROM J. C. KRAMER, OF LA CRESCENT.

Apples have had a severe winter. What trees the frost did not kill the mice have gnawed. Have lost eighteen healthy, thrifty trees, mostly seedlings and Duchess in bearing order; some about six inches in diameter. Mr. Brown, here, had all his grapes destroyed by mice. Duchess apple the best with me, and least injured. Generally trees killed back two or three years' growth, and the joints appear to be turning black. I do not look for a crop this year. Have some seedlings not in the least injured, some of them have not fruited yet; will send you samples of the best. My locality is sheltered from the east, and some of my trees are twenty-one years old. One seedling, which I think entirely hardy, has been injured some by the whiffletrees in plowing, and it may not live much longer. Last year's growth about one-third killed back. Situated in section nine, La Crescent township. Soil sandy clay, east slope.

Strawberries are in good condition so far. Raspberries are frozen badly. Currants are in good condition. Blackberries: The Snyder is frozen to the ground. Grapes: Those that were laid down are healthy; the softer sorts are hurt badly. Think the Concord will come out all right. About half of last year's growth injured.

I have about a dozen seedling trees of a variety that I have in orchard twenty-one years of age, and from which I have had eleven crops; has taken several premiums; tree slightly hurt.

FROM H. G. GROAT, ANOKA.

Small fruit looking well, considering the severe winter. The Turner raspberry alive to the tips; lost Ruby, Clark, and Black-caps—frozen down to the snow line. Strawberries are all right where heavily mulched; those that were uncovered were all frozen more or less.

FROM W. GOLDIN.

PLAINVIEW, April 8, 1885.

Apples — Wealthy uninjured; Russians come out very fine; Tetofsky sound; Duchess injured some on tips of last year's growth. Of crab varieties I have Transcendent, Orange, Hyslop, Minnesota, Whitney No. 20, Strawberry, and some dwarfs, — names not known; all came out sound. Am well protected by large forest on the north and west. Have examined some other orchards, and find them considerably hurt where exposed. Mr. J. Hessing's orchard, which was much exposed, Wealthy and Duchess, all last years' growth dead except some trees on old sod, which are uninjured. The bodies appear sound. Noticed the limbs on Gen. Grant were hurt. A few trees — names I don't recollect — were sound. This orchard contains about one hundred trees, but think the most of them will look "sorry" the coming season; they were all in bearing. He also has a large vineyard for this county, but most of them are yet covered. What we examined are fine; also his strawberries. I have of raspberries Cuthbert, Superb, Turner, Clark, Reliance, and Herstine (red), all in fine condition; Yellow Florence hurt badly; Dayton, Orange, killed to the ground; Davidson's Thornless (black) dead; Doolittles badly hurt; Gregg hurt somewhat. Of blackberries have Taylor, Wallace, and Lawton; all dead to snow line. Have had peach trees, but with the best protection I could give them they have now yielded to the inevitable; have had them some three years, but last winter "blocked" my wheel. Pears all dead; quinces dead; currants in good condition, and strawberries all look very fine. My grapes, I think, will come through fine. Fruit prospect for apples is poor. Some fruit buds, but that does not insure fruit on trees. Small fruit prospect good. We are in township 108, range 11, south-east quarter of section 35; Hessing, on section 36; soil, clay, covered with some black mould. Do not know of any unknown variety that is sound near here; there is one tree of some promise, but the ends of limbs are hurt. Should present prospects change I will report. Think it well to delay printing the book until we can see full results from the severity of the past winter.

FROM A. G. TUTTLE.

BARABOO, WIS.

Mr. Tuttle writes of the Russian varieties of apples in his orchard and nursery that they are "O. K. in bud and twig; Russian cions bright; on Duchess nearly all first buds killed."

Mr. Tuttle says: "I shall not be able to give you any report on cranberries. I am not as well posted as my son who has for several years lived upon the marsh and made thorough improvements; I hoped he would send you a paper for your report."

By permission of Mr. Tuttle we clip the following from *Farm, Stock and Home*.

FRUITS AND THE PAST WINTER.

BY A. G. TUTTLE.

Thinking you might be glad to hear from Wisconsin as to the condition in which the past very severe winter has left us, I have made an examination of the various fruits. I find a show of more injury than I have ever seen at this season of the year. The fruit buds of all the common apples, except Wealthy, Duchess, and Tetofsky, are mostly destroyed, and the inner bark of the terminal growth more or less colored. I made a thorough examination of one of my Russian orchards, comprising eighty varieties of new Russian apples, and found the fruit buds uninjured and all the wood growth in perfect condition.

I have three hundred Duchess in orchard, making a magnificent show. Fruit wood growth and fruit buds all right. Had we needed any further evidence of the extreme hardness of Russian apples, their condition after such a winter, as compared with other apples, ought to satisfy anyone.

I find most of the roses, well covered with hay and also with snow, dead to the ground; something I have never known before, even after our coldest winters.

Raspberries generally destroyed. Blackberries badly used up above the snow line. Ancient Briton proving hardier (as it did the winter previous) than Snyder or Stone's Hardy.

The prospect for cranberries is most excellent. The vines are in good condition, having been covered with water and snow through all the severe cold weather of winter. A very large crop is looked for.

I think nursery trees of any but the very hardiest varieties may be unsafe to transplant, for while they do not show sufficient injury to prevent their growth if not transplanted, the check from transplanting, in addition to the injury by the winter, might be fatal to them.

I am sure that from the trial now making with new apples, we shall soon have varieties suited to all seasons adapted to Wisconsin and Minnesota, that will make apple growing in these states as certain and profitable as in any portion of the country.

On the whole, these test winters, as they must come, are not wholly pregnant with evil for the fruit interest of the Northwest. Each one should stimulate to new exertion, and carry us forward to what I am confident we shall ultimately attain — complete success.

FROM EMIL J. CLAUSSEN.

BISMARCK, D. T., March 28, 1885.

My trees are all Russians from Prof. Budd, two to three years old. This is their first winter up here. Being my first experience with fruit trees, I cannot give definite information, but there is apparently very little damage to Russian varieties. Soil clay loam, east slope; cornstalks left standing among trees; also a small mound of earth. Will report further next winter and try to be at your annual meeting.

Mr. Claussen sends the following additional report.

BISMARCK, D. T., April 20, 1885.

As a further report on Russian apple trees, I would say: The Antonooka seems to have stood the winter test the best of any one variety. The Longfield I am inclined to think will be first-class when we get it grafted on an extra early maturing stock; some of its shoots did not form terminal buds. The summer behavior of all seems perfect, although planted after most of them had started. The Russian White Poplar of the several varieties I have, seems perfectly adapted to this climate and longitude, where the cottonwood is a failure on the bench lands.

FROM E. H. S. DARTT.

OWATONNA, MINN., April 25, 1885.

I regard it too early in the season to determine, even approximately, the extent of injury trees have received. I expect they will continue to die for a year or two from effects of extreme cold of past winter. I answer your questions briefly.

First—Seriously.

Second—All injured more or less.

Third—Russians.

Fourth—A blackening of wood from a point eight to ten inches from the ground upward. This point was apparently the snow line at the time of the coldest weather, December 25th. The line is very distinct, one-half inch changing from perfectly sound wood below to the apparently dead wood above. In some varieties, notably the Duchess and Tetofsky, the dividing line between the bark and wood remains distinct, the bark appearing healthy. I think most of these will live, while in some other varieties the blackening of wood seems to extend into the inner bark, and I look for many of these to die during the season.

Fifth—Apparently fair.

Sixth—No.

Seventh—Mostly in apparently good condition. Some are badly injured.

Eighth—No.

Ninth—A great many varieties of soils and aspects. No protection except by wind breaks.

Tenth—All right as far as I know. I regard the prospect favorable for a good crop of fruit.

FROM J. W. POOLE.

EUREKA, DAKOTA CO., Minn., April 27, 1885.

I find the past winter has proven one of the severest we have had for years on apple trees; from the present appearance nearly all of the hybrids are somewhat affected. Even on the Wealthy the wood is badly colored on last year's growth; Duchess damaged some; the Orange crab seems to stand the test the best of any in my orchard. Stone's Hardy blackberry are killed down past the snow line nearly to the ground, and I have my doubts if they will prove worth bothering with. In central Minnesota, from the present appearances, a fair crop of raspberries will be real-

ized from the Turner, Philadelphia, Cuthbert, Caroline, Florence and Doolittle; the Gregg and Mommoth cluster is killed nearly to the ground. The Russian Mulberry here are alive nearly to the top. The prospect for strawberries here is good for a crop.

FROM ANDREW PETERSON.

WACONIA, April 27, 1885.

My trees are injured more or less. The standard varieties—Duchess and Wealthy—the wood of last year's growth is damaged a good deal; when I cut into it, it has a light brown color, and part of the buds are dead. I have split the fruit buds and examined a good many; some of the inner part of the buds are fresh yet, and perhaps they will bring fruit yet. I have five or six varieties of Russians that the fruit buds are not injured at all, but the last year's growth of the wood is a very little colored; so slight it can hardly be seen. I have another Russian tree that is not damaged at all. There are half a dozen other varieties of Russians that were just as much damaged as the Wealthy and Duchess.

The soil in my orchard is black, mixed with sand, and lays on a clay bottom. I have no kind of protection for trees.

The strawberries and currants are all right. Part of the raspberries are injured some.

FROM M. J. HOAG.

ROCHESTER, MINN., May 3, 1885.

In my judgment the past winter will prove to be the most disastrous to fruit trees, particularly the apple, that has ever visited our State. It is yet too early to determine just to what extent the damage may be, but from present indications the outlook for the apple interest of Minnesota, is anything but promising in this locality.

The following standard varieties, Wealthy, Duchess, Haas, Peach, and Tetofsky—and among the hybrids, Transcendent, Hyslop, Orange, Power's, on my grounds, passed the memorable winter of 1872-3 unscathed; while to-day these varieties show badly discolored wood, particularly the Wealthy and Haas. I have one hundred and sixty trees of the latter variety in orchard just ready to yield a liberal return for years of outlay, that to-

day reveal no signs of future usefulness, but are simply "cumberers of the ground." The Wealthy, Duchess, and Peach are a shade better. I find the least discolored wood in the Early Strawberry, a variety, by the way, of the hybrids, having but few equals as a dessert apple in this country. From this variety am hopeful of a fair crop of fruit.

The Turner raspberry comes out of winter quarters without a blemish—never looked better. Brandywine and Philadelphia in good condition. Blackcaps: Ohio, Tyler, and Lonegan in splendid condition. Am hoping for a bountiful crop of raspberries.

Grapes, if protected, are all right, and the unprotected ones are all wrong.

Strawberries, in appearance, are all that can be desired, and, barring untimely frosts, or droughts, we are sure of a fair crop.

Currants ditto.

With all my misgivings with reference to apples, I am still hopeful that time and favorable conditions may yet find deliverance for our precious varieties of the apple, that just now seem to be in so much danger. The Russian varieties that are being introduced in Minnesota will, I think, in due time solve the problem of apple raising in our State.

FROM SIDNEY CORP.

HAMMOND, Minn., May 5, 1885.

My trees have gone through the winter all right; did not lose a tree by winter killing. When your first letter came, I examined my trees and found the wood some colored, and buds in a condition too backward for me to be able to state correctly; but now I find the wood all right and a prospect of a good bloom with exception of a few very tender sorts. I have but three of the Russian varieties in bearing; they are all right, they are the Yellow Anis, Autumn Streaked and a white Russian apple name not known, of the Tetofsky type, but far superior in tree, and equal in fruit. The Autumn Streaked is one of the very best summer apples that I have ever raised; the Anis is under size.

FROM F. G. GOULD.

EXCELSIOR, MINN., May 5, 1885.

I have observed the condition of fruit trees and plants to some extent in this neighborhood this spring. It is too early at this

date to be altogether accurate in our conclusions; but I think the condition of trees and plants indicate the severest winter for years, if ever before. What are known here in Minnesota as standard apple trees are killed or badly damaged, except Duchess, Wealthy, and some of the Russians. and the latter show more or less injury. Those showing the least injury I will designate as belonging to the Hibernial or Lieby family. These latter, so far as can be seen, show but very slight injury, really appearing at better advantage than Transcendent crab, which carries some marks of the severe conflict of the winter of 1884-5.

The snow fell in good season last fall; not in large quantity, but enough to cover the ground sufficiently to give proper protection to the roots of trees and all plants which require protection by covering, including strawberries and grapes. If all other conditions are favorable, good crops of these may be expected, though it may be safe to say that the leaf roller on the strawberry plant, which appeared last year, may be looked for in greater numbers the present season. I find blackberries are badly damaged. The Turner raspberry is generally looking well. Currants and gooseberries promise a good yield.

The crab apple trees, Duchess and Wealthy begin to show blossom buds, and we may expect some fruit from them: also the Russians, which are with me but few in number at present.

FROM SETH W. KENNEY.

MORRISTOWN, RICE COUNTY, MINN., May 6, 1885.

Yours of April 30th is at hand with regard to amber cane prospects. The present prices of sugar are the lowest ever known. This has a corresponding effect on amber cane products, so that in twenty-six years the prices never have been as low as now. I have several thousand gallons of syrup on hand, and the wholesale prices in Minneapolis and St. Paul for best refined is only thirty-five cents per gallon, *delivered*. This reduces the profits below some other branches of farming. I propose to sell my surplus syrup and not *produce any cane* till another year.

The present prices will not warrant the large expense of a crop of cane which requires a large cash outlay of at least \$2,000. I shall plant corn, believing it will pay *better* than syrup at present prices.

I am selling my syrup in a small way at forty-five to fifty cents, and can probably work the present stock off at that price before a year from now.

FROM C. E. SHANNON.

GRANITE FALLS, MINN., May 8, 1885.

Your letter of the second instant inquiring as to the effect of the past winter on fruit in this section was duly received. In reply will say that I see no bad effect yet on apples. They seem to be starting as usual from the terminal buds and promise to bloom freely. Strawberries, however, have not fared as well. We had no snow in this section this winter and a few days of very high wind, which in many instances blew off the covering and I hear complaints from a good many places that the plants seem to be dead. Later developments may show that apples have sustained injury, but I see no evidence of it yet. All other small fruits seem to have come through the winter in good shape.

FROM M. PEARCE.

LAKESIDE NURSERY AND ORCHARD,

MINNETONKA, May 9, 1885.

The past winter has been the severest on fruit trees that we have had for twelve years. To what extent the trees are injured at present I am not able to determine; but from careful examinations made of various soils and locations I find a marked difference. On high ground, with clay soil, trees are injured the least. Of the varieties usually planted, that stood the winter best, are Beach's Sweet, Giant Swaar, Kimball, Whitney No. 20, Duchess, Wealthy, and Orange; and it affords me great pleasure to state (as hard as the winter has been) that I have one Russian variety that is as rapid a grower as the Transcendent; fruit large, and a good quality; keeps as long as the Wealthy. It came out in perfect condition this spring. I cut cions from it and grafted this spring, and they are all growing. When this and other good Russian varieties are propagated and planted over the State, I am confident we will have iron-clads that will stand, without injury, any Minnesota winter. I say to every fruit grower, keep your courage up. The past winter has demonstrated beyond all doubt what will stand through all winters, let them be hot or cold. Growing trees and fruit is the business of my life; have labored faithfully and hard, and I am not discouraged; I see a bright prospect in the future for Minnesota. It is my desire to go on record as one that assisted in bringing

out varieties of apples that will be a blessing to the people of Minnesota. My orchard of 4,000 Wealthy apple trees are not dead. The most of them will recover. My nursery trees are injured but little if any. The wood is white, and they are coming to the last bud.

Turner raspberry not injured; Cuthbert and Gregg badly injured; currants in good condition; grapes wintered well; strawberries never looked better.

FROM FRED VON BAUMBACH.

ALEXANDRIA, DOUGLAS COUNTY, May 11, 1885.

I have about thirty varieties of Russian apples in orchard, the most of them obtained from Prof. Budd, of Iowa, two years ago, and the balance of last year's planting. I find on examination that about two-thirds of my trees wintered first rate and show no material injury either in wood or bud. This condition indicates very plainly, I think, that we shall have no difficulty in raising an abundance of apples in Northern Minnesota, of the hardiest Russian varieties. My trees had no protection, except from boards placed on southeast side of trees to prevent sunburn, and natural groves surrounding orchard. Have not succeeded well thus far with the Wealthy.

Have some fifty grape vines in splendid condition, especially Janesville; vines were well covered during past winter.

FROM OREGON.

A correspondent, writing from Northern Oregon, under date of April 8th, says: "This is an excellent climate for fruit raising. A great many do not turn their attention to its cultivation except for their own use, as the product thus far has not been found very profitable. Apples, pears, plums, of many varieties, prunes, cherries, grapes, and all the small fruits can be raised in abundance. Peaches, apricots, and quinces are raised to some extent. Last fall many bushels of apples were left on the trees ungathered as farmers did not care to gather them when they were only worth from twenty-five to fifty cents per bushel. The fruit here grows very large and is of fine flavor, much better than that of California. Berries seem to contain more acid than those raised in the Eastern states."

HORTICULTURAL EXHIBIT AT NEW ORLEANS
EXPOSITION.

REPORT OF THE SUPERINTENDENT, F. G. GOULD.

EXCELSIOR, MINN., May, 1885.

We began to make collections of fruits in the month of June, 1884. The small fruits, including strawberries, raspberries, blackberries, gooseberries, highbush cranberries, black cherries, and blueberries were preserved in solutions, in white jars. Plums, tomatoes, some of the early apples, and a collection of eight or ten varieties of grapes were exhibited in these jars; there were over one hundred jars, the sizes running from one pint to one gallon.

I started for New Orleans with this fruit on the evening of the nineteenth of November; arrived at Chicago on the evening of the twenty-second. I decided to try to hold my car there until the balance of the train came up, as the car was jerked and thumped by switching in with mixed way freight cars. We started from Chicago on the twenty-ninth and arrived at Cairo, where we had our car iced, on the thirtieth, and arrived at New Orleans on the second of December. The fruit remained in the car until the twelfth day of January. We kept ice in the car most of the time after its arrival at New Orleans until the fourth of January, after which the fruit was subject to the prevailing temperature of that exceedingly variable climate.

On the thirteenth of January the structure upon which our fruit was to be exhibited in the Government and States Building was so nearly completed that we began setting up the fruit; nearly a week was consumed in its preparation and arrangement. On the fourteenth day of January we took samples of our grapes to Horticultural Hall, as this was the place where the competitive exhibition of fruits was to be made. Our grapes had ripened and were cut from the vines three and some of them three and a half months previous to this date. Great care had been exercised in handling, wrapping, packing, and repacking the grapes, both before and after their arrival at New Orleans. We made fifteen entries for prizes in the name of the Minnesota State Horticultural Society. The following awards were made on our grapes.

Best collection, ten varieties, silver medal.....	\$25 00
Best collection, five varieties for table, silver medal.....	15 00
Best collection, five varieties for wine, silver medal.....	15 00
Best plate Brighton.....	5 00
Best plate Concord.....	5 00
Best plate Catawba.....	5 00
Best plate Delaware.....	5 00
Best plate Iona.....	5 00
Best plate Lindley.....	5 00
Best plate Massasoit.....	5 00
Best plate Wilder.....	5 00

No other state or territory received any awards of medals on grapes except California. The best thing of all, as I regard it, is our victory over the Catawba grape-growing district of Ohio. About twenty-five pounds of their Catawbas were brought there in splendid condition and entered for competition. They were very good grapes, but Minnesota exhibited better ones and hence received the award for best Catawbas.

Our display consisted of sixty plates, of eleven varieties, set up in fifteen different competitive combinations for prizes. We had already lost several varieties on account of the difficulty of keeping them sound so long after they were harvested, although most of the varieties which we exhibited were nearly perfect in appearance when set up, and were conspicuous as being the largest grape display in the building. The fact that Minnesota should attempt anything of the kind was a surprise to all of the people. All sorts of things were said about us; some could not believe our grapes were grown in the open air; there was some hocus-pocus about it; others that they could have "beaten" us if they had succeeded in keeping theirs "in condition;" and many other criticisms, usually in a friendly spirit. But the remark that two requisites were necessary seems to cover the ground; namely, to have some very superior grapes and to be able to place them on exhibit in good condition, as late as on the fourteenth day of January, over ninety days after they were gathered from the vines. This we succeeded in doing; and duty compels me to say that Mrs. Gould contributed largely toward this success by her good judgment and personal care of this fruit at times when it was not possible for me to attend to it.

Our grapes remained on exhibition in Horticultural Hall until the twentieth of February, and, strange as it may seem, were so well preserved at that late date as to be considered ornamental and attractive.

The names of contributors of grapes are A. Bonjour, A. W. Latham, Rev. C. B. Sheldon, and F. G. Gould, all of Excelsior, Hennepin county.

The sixteen kinds of fruit jellies, prepared and donated by Helen M. Gould, were put up in one hundred goblets, or wine-glasses, representing sixteen shades, running from a light amber to a deep purple, and so perfectly clear that the interested lady visitors could not resist the temptation to tip the glasses (carefully, of course), expecting it to flow like wine. We had over one hundred bushels of Wealthy apples alone, and between five and six hundred pounds of grapes. The weight of our fruit exhibit, including packages, when loaded on a car at Minneapolis, was four and a half tons.

Our apples never went to Horticultural Hall for competition, with the exception of a few single plates, which did not exceed a peck in quantity. These included Duchess and Wealthy. Each received the prize for best plate of the variety.

By direction of the commissioner of Minnesota our principal display of fruits was made in the government and states building, with the collective exhibits from the State. The structure upon which the fruit was displayed was about forty feet long and seven feet wide, divided into five sections, raised two steps, making one central, two intermediate, and two end sections. Upon the central section two wire structures were placed back to back. These were constructed with two pockets, or baskets, one above the other, the upper one being six feet above the table. About six bushels of apples were placed in these two wire structures. Twelve wire globes, standing thirty inches high, on stems or bases of wire, holding something over a half bushel each, were filled with apples and placed on the corners of the end and central sections. The glass jars were ranged along the steps, about on a level with the eye, all along the structure, except the easterly section, upon three faces of which the jellies were displayed. Plates of apples occupied the most of the first or lower step of the table, and among the globes on the higher portion, cranberries were shown in numerous glass fruit dishes.

A section of cranberry marsh two and one-half by three feet, with nice fruit on the vines, was placed in a zinc tank here in Minnesota and shipped to New Orleans in perfect condition. A mirror on the back, under the cover, gave the appearance of double the actual size of the swamp, the latter being in a box under a glass cover at the end of the table. Some of the vines

had grown as much as three inches on the first of March. This green swamp not only suggested to every Minnesotian a thought of his own country, but was attractive and interesting to strangers; probably not one visitor in a thousand ever suspected that the swamp was of the actual dimensions given.

We started into this work with the determination to make the exhibit creditable to our State, my wife assisting me from the start, without charge to the State, devoting our first attention to the various details and accumulating responsibilities, connected with the preparation, storage, and care of the fruit. How well we succeeded in discharging the duties of the trust confided to our care, comparatively few of the citizens of our State had an opportunity to judge, from an inspection of the fruit display at New Orleans; and, to afford all others a better opportunity to judge than by anything we might say, we have appended some of the opinions of others, the most of whom are entire strangers to us. In conclusion I desire to thank all who contributed in any way to our exhibit.

The names of those who contributed fruit will be found with the list of fruits. Among others who rendered valuable assistance I will mention the names of Mr. Geo. S. Woolsey, of Minneapolis, who helped me at New Orleans in getting our grapes to Horticultural Hall for competitive exhibition. I also wish to acknowledge kindly advice and aid from Mr. Geo. A. Brackett, Col. Samuel E. Adams, Mr. H. A. Gale, Prof. N. H. Winchell, Col. Harbaugh, and others; also, to Mr. A. W. Sias, of Rochester, and Mr. O. M. Lord, of Minnesota City, for valuable aid in collecting and forwarding the best fruits of their neighborhoods; and, lastly, to Gov. L. F. Hubbard be the credit of rendering such assistance as made it possible for us to bring our exhibit up to the greatest point of excellence during the month of February when the largest number of visitors were in attendance at the exposition.

WHERE THE FRUIT CAME FROM.

Wealthy apples, Duchess, donated by Geo. H. Klos, Carver; Hyslop, donated by Mrs. M. S. Gould, Excelsior; Seedlings No. 5, No. 1, No. 2, Wealthy, donated by August Krouse, Waconia; Wealthy, donated by Wm. Sarver, Excelsior; two bushels Wealthy, donated by F. G. Gould, Excelsior; from Andrew Peterson, Waconia, Wealthy, Hibernial, Astrakoff Glass, Lieby,

Charlamoff, Sweitzer, Imperial, Winter Pear, Minnesota, White Astrachan, Winsted, Pippin; from Geo. W. Clark, Winona, Golden Russet, Perry Russet, Hyslop, Utter's Red, Ben Davis; from F. S. Shanley, Howard Lake, Aiken's Striped Winter, donated; from Wm. Bardwell, Excelsior, Hyslop, Excelsior Plums, donated; from J. T. Grimes, Minneapolis, Hyslps, donated; from Rev. C. B. Sheldon, Excelsior, Catawba grapes; from A. D. Leach, Excelsior, cranberries; from A. Bonjour, Excelsior, grapes: Iona, Merimac, Salem, Massasoit, Lindley, Delaware, Wilder; apples: Wealthy, donated; from Mrs. Anna B. Underwood, Lake City, Desota plums, donated; from D. Q. Burley, Minnesota City, Perry Russet, Hyslop, Utter's Red, Walbridge and fourteen sorts of seedlings; from G. Whetstone, Minnesota City, five sorts seedlings, English Russet, Haas, Utter's Red; from E. B. Jordan, Rochester, Wealthy, Pewaukee, Melinda, Rollins Russet, Longfellow, quart blackberries; from N. C. Stubbs, Long Lake, raspberries, Gregg and Cuthbert, Smith gooseberries, donated; from Miss Helen M. Gould, Excelsior, one hundred glasses fruit jelly, sixteen sorts; from A. W. Latham, Excelsior, grapes: Cottage, Lady, Lindley, (Rogers No. 9), Massasoit, (Rogers No. 3.), Brighton, Telegraph, Perkins, Worden, North Carolina, Black Hawk, Delaware, Concord; apples: Wealthy, Lieby, Swan; from F. G. Gould, Excelsior, grapes, Concord, Delaware, Martha, Iona, Janesville, Worden, donated; from O. C. Tucker, Winona, Fameuse; from Mrs. Anna B. Underwood, Lake City, Wealthy; from B. Taylor, Forestville, Wealthy and Ox apples, donated; from William Morse, Excelsior, Hyslop; From Wm. McHenry, St. Charles, Golden Russet, Roxbury Russet, Wealthy, Spice Sour, McMahon White, Wabasha, Wabasha Pear, Elgin Beauty, Duchess, Burley, donated; from E. S. Bardwell, Excelsior, Duchess, donated; from O. M. Lord, Minnesota City, seedling apple, and Rollingstone plum, donated; from P. M. Gideon, Excelsior, seventeen sorts apples, and two of peaches, donated; from Charles Ludluff, Carver, sixteen sorts of apples, donated; from Mr. Miller, Dodge Centre, seedling apple, donated; from Andrew Peterson, Waconia, peck butternuts, donated; from Eli Stone, Excelsior, Wealthy, donated; from J. J. Cale, Northome, Wealthy; from Albert D. Cook, Anoka, two quarts hazel nuts, also Clinton grapes, donated; from Mrs. F. G. Gould, Excelsior, six jars raspberries, two jars Snyder blackberries, Martha and Iona grapes, donated; from J. S. Harris, La Crescent,

hickory nuts, apples, Alaska, No Name, Plum Cider, Talman Sweet, Walbridge, Willow Twig, name lost, Mother, Deomin, Bailey Sweet, Seek No Further, Utter, donated.

COLLECTED BY A. W. SIAS, FROM

Wm. Somerville, Viola, Rollins Pippin, Prolific, Rollins Russet, Wabasha, Melinda, Charlamoff, Haas, Fameuse, New York Pippin, Gideon No. 6, donated; J. Q. Richardson, Elgin, Melinda, Rollins Russet, donated; J. W. Hart, Dover, new seedlings, Hart, May, Brett, Hyslop, donated; Frank Whiton, Viola-Elgin Beauty, Red Saxton, St. Lawrence, donated; Sidney Corp, Hammond, McMahon White, Autumn Streaked, seedlings, donated; M. Kepner, fine winter apple, unknown, donated; T. E. Richardson, Elgin, Green Oak, Yellow Oak, Red Oak, donated; L. H. Golding, Viola, Seedling No. 1, Seedling No. 2, Seedling No. 3, donated; Wm. Forster, Chatfield, Forster's Red Winter, Forster's Sweet, donated; M. W. Cook, Rochester, Russian, unknown, donated; Rev. Charles Woodward, Rochester. Gen. Grant, donated; Wm. Brown, Rochester, Utter's Red, donated; Robert Waldron, Rochester, Seedling No. 1, Seedling No. 2, donated; A. W. Sias, Rochester, Russians, Winter Lowland, Red Black, Leipzig Borsdorf, Yellow Anisette, Red Anisette.

Jars in solution, A. W. Sias, Red Anis, Rollins Hybrid, Yellow Anis, Rose Plum; Sidney Corp, Autumn Streaked, W. O. Crittenden, Smelling apple; I. W. Rollins, Heidorn's Streaked; Wm. Forster, White Astrachan; R. L. Cotterell, Haas, Fameuse, Cotterell Plum; Mrs. A. M. Brown, hybrids; Samuel Wheeler, Orangeleaf; Wm. Forster, seedling; Mr. Hanks, Wild Plum; Chas. Woodward, J. Virginiana; E. D. Sias, Black Haw, V. Prunifolium.

CANNED FRUIT, COLLECTED BY F. G. GOULD.

Duchess, Mrs. J. Seckler, Excelsior, donated; Glendale Strawberry, M. W. Cook, Rochester, donated; blueberries, wild, from Anoka county; Lowell's Excelsior plum, Wm. Bardwell, Excelsior, donated; Bender plum, Mr. Bender, Chanhassen, donated; peaches, P. M. Gideon, Excelsior; De Soto plum, J. M. Anderson, Lake City, donated; Duchowoe (Russian) and Yellow Sweet, E. H. S. Dartt, Owatonna, donated; Cuthbert raspberry and Gregg raspberries, N. J. Stubbs, Long Lake; wild blueberry,

from Mille Laes county; grapes, A. D. Cook, Excelsior, donated; Miner plum, S. Bates, Stockton, donated; Rollingstone plum, O. M. Lord, Minnesota City, donated; plums, Mr. Bender, Chanhassen; plums, Wm. Bardwell, Excelsior, donated; black cherry, wild, F. G. Gould, Excelsior, donated; Russian apple, J. H. Moulton, Minneapolis; Smelling apple, W. O. Crittenden, Dover, donated; black cherry, L. G. Sampson, Excelsior, donated; wild black cherry, from Hennepin County; Charlamoff, Andrew Peterson, Waconia; gooseberries, N. J. Stubbs, Long Lake; tomatoes, two varieties, Mrs. A. J. Caswell, Coon Creek, donated; husk tomato, John Sampson, Excelsior; raspberry, Mrs. Young, Waseca, donated; Fameuse, tomato, William Roma, Minneapolis; Russian apples, Andrew Peterson, Waconia; Hybrids, Mrs. A. M. Brown, Plainview, donated.

CANNED GOODS, ETC., DONATED BY

F. G. Gould, Excelsior, Hyslop crabs, three jars, Whitney No. 20, Janesville grape, Brier's Sweet, two jars, Wealthy, tomatoes, two jars, raspberries, blackberries, two jars, Golden Cap raspberry, plums, two jars, Duchess, Turner raspberry, Delaware grapes, highbush cranberries, two jars, Wilson strawberries, four jars, Apricot plum, Lowell's Peach plum, Transcendent crab, two jars, Gem crab, Martha grape, three jars, Snyder blackberries, Philadelphia raspberry, Rogers No. 15 grape, Iona grape.

MINNESOTA AT THE WORLD'S FAIR.

WHAT THEY SAID ABOUT MINNESOTA'S EXHIBIT.

We have given a good deal of time to the Minnesota exhibit, and pronounce it as good as any of the states, especially the fruit. We are proud of it. The jellies are fine.

D. and E. J. BASSETT,

Feb. 21, 1885.

Minneapolis, Minn.

I think it the finest display I have seen.

MRS. E. P. BEEMAN,

Excelsior, Minn.

I think it the finest display in the building.

E. P. BEEMAN,

Feb. 14, 1885.

Excelsior, Minn.

Minnesota was remembered by its fine display of fruits, and their tasteful arrangement.

Feb. 16, 1885.

MARY BARNES,

Barry, Mo.

The fruit display is such that we, of the State of Minnesota, are surprised at the many varieties raised in our State, and that the same is so finely arranged.

Feb. 24, 1885.

G. W. BUSWELL,

H. P. COURTAES,

E. D. SOUTH,

Blue Earth City.

WM. COURTAES,

St. Paul.

Myself and boys vote this Minnesota fruit display rather the finest we have seen, and decidedly the jellies take the cake.

MRS. O. W. ROBERTSON,

Feb. 16, 1885.

Milwaukee, Wis.

Minnesota has a fine display of fruit and jellies very attractively arranged.

Feb. 16, 1885.

MRS. WHIPPLE.

So say we—all of us.

Q. A. WHIPPLE,

Rhode Island.

In passing through the Minnesota exhibits we could but stop to admire the exhibit of fruits, both fresh, canned, and jellied, arranged by the superintendent, F. G. Gould, and wife, from Excelsior. Some of the baskets holding the fruit were designed by Mr. G. especially for the purpose, and were beautiful. The display was excelled by none.

MRS. T. J. TEMPLE.

February, 1885.

Mexico, New York.

Minnesota, in her fruit exhibit, excels all ideas of the public as to her capacity in that line. The display is arranged with great taste, and from the adjacent spaces attracts universal attention. The lady in charge is kind, and ever ready to give information to visitors.

ELIZA GREENWOOD,

February, 1885.

New Orleans, La.

The Minnesota fruit is the best on the grounds.

MR. and MRS. H. C. GRAY,

Chicago, Ill.

It is with much delight we indorse the extreme excellence of Minnesota exhibits, especially fruit product.

A. and R. McDONALD,

Feb. 19, 1885.

Canada Pioneers.

The Minnesota fruit display is beautiful and artistic, reflecting much credit to the State and gentlemen who arranged it.

MISS MAUD ROCHESTER,

New Orleans, La.

The best display in the hall.

MRS. P. CARPENTER,

Barry, Mo.

Minnesota's fruit exhibit is in every sense elegant and the handsomest arranged I ever saw.

MRS. F. M. FREEMAN,

MRS. WYCHE,

Macon, Ga.

The fruit exhibit of Minnesota not to be excelled on the grounds. Hope the State authorities will keep the same replenished.

A. A. MYERS,

Feb. 24, 1885.

Williamsburg, Ky.

Minnesota fruit exhibit is a surprise to us, as also many of her departments. The kindness of her lady exhibitor is fully appreciated by an Ohio sister.

ALICE A. KOLLER,

Feb. 18, 1885.

Bloomville, Ohio.

The Minnesota exhibit of fruits, in charge of Mr. Gould, of Excelsior, is exceedingly attractive, and is much admired by visitors.

J. K. CLAGETT,

Hastings, Minn.

MR. and MRS. P. A. CLAGETT,

New Orleans, La.

The display of fruit of Minnesota is certainly very fine, and the arrangement reflects great credit upon those who arranged it. The fruit, as well as the courteous lady and gentleman in charge, is all that could be desired.

MRS. KYLE,

Brooklyn, N. Y.

The Minnesota exhibition of beautiful fruits is the finest in the grounds.

J. R. MCKINNEY,

Minneapolis, Minn.

The Minnesota fruit display is fine, and the variety is good. I think it deserves especial notice. Is second to none.

M. J. BURNS,

Feb. 23, 1885.

St. Jo, Mo.

The jelly is the finest I ever saw.

MRS. C. H. BRADSHAW,

New Orleans, La.

It is the clearest and most perfect jelly I ever saw in my life.

MISS L. BRADSHAW,

New Orleans, La.

After examining the many different displays of fruit, I think the one from Minnesota the finest, particularly the display of apples, and certainly the lady in charge of that department one of the most pleasant and accommodating among the many in the building. We will remember the Minnesota department with pleasure.

Feb. 23, 1885.

CLARA WILSON,

MARY PARIBLE,

Franklin, La.

The best exhibit of fruit in the building, and far excels the others in decoration.

Feb. 23, 1885.

BEATRICE DAVIS,

MRS. A. C. HARKEY,

MRS. A. L. BAILEY,

MISS WILLIE DAVIS,

Salado, Bell Co., Texas.

I am a resident of the State of Maryland, and one much interested in fruits of all kinds, and during my inspection of the products of the states at the exposition at New Orleans, among others, the fruit display of Minnesota pleases and deserves of me special mention. Though not so large in size, they are rich in variety. I heartily commend the fruit inspected, and speak from a personal knowledge of the flavor of the apple called the Wealthy.

J. T. EDWARDS,

Feb. 24, 1885.

Cumberland, Md.

The following is an extract from a letter written by Charles Hallock, and published in the *Pioneer Press* of March 4, 1885.

F. G. Gould's fruit display is still attractive, although decay has made sad inroads upon it. Notwithstanding the trying climate, it has been kept up a month longer than was expected. It is very artistic in its arrangement, and has elicited great praise even from most emulous competitors. There are (or were) one hundred varieties of apples shown. One of its most interesting features is a natural cranberry bog, with the fruit still on the vines. Southern people ask if they are cherries. There are one hundred glasses of jellies, very fine, of various fruits and flavors, donated by Miss Helen M. Gould, and so transparent that people mistake them for wines. There are cherries, plums, berries and various small fruits in jars. There are some jars of extra large strawberries, and some of clusters of grapes weighing a pound. This show took three medals and eight prizes on grapes, sharing the reward with California only, and beating Ohio on her famous Catawbas. Visitors and exhibitors are surprised to see what Minnesota can do in horticulture and fruit growing.

AMBER CANE AT NEW ORLEANS.

Seth W. Kenney, of Morristown, Minn., superintendent of amber cane products at New Orleans, writes, in March, to the *Minneapolis Tribune* as follows:

"It has been several years since I have furnished articles for the *Tribune* on the culture of the Minnesota early amber sugar cane, being obliged to give my refinery my undivided attention. I have just returned from the World's Exposition at New Orleans, where I have been engaged as superintendent of amber cane products. It was proclaimed to all nations that Minnesota took the highest awards on amber cane products, on syrup one premium, and, for the best barrel of any grade exhibited, the sweepstakes premium. My position at New Orleans brought me in contact with the planters of the South, and with those that were well informed in regard to both Northern and Southern cane. From those men I learned many things that were new to me, and perhaps of interest to your readers. I learned from William Wakerman, Jr., of Oshkosh, Wisconsin, that all the hams and shoulders in their extensive pork packing establishment were pickled with amber cane syrup, and gave the best of satisfaction. Mr. John Dimond, vice-president of the sugar exchange, and a heavy planter, said he was much surprised at the excellence of the samples grown in Minnesota. He said that the Northern cane industry, so widely extended and already producing twice the amount of syrup produced by the Louisiana cane, must be an important factor in helping to protect the sugar industry. Mr. Dimond read a very valuable paper before the Farmers' Congress at New Orleans. He also took samples of the Minnesota product to the sugar exchange at New Orleans to show to the planters what was being done in Minnesota, and repeated what some of our best men have said, that we can produce sugar as cheap as they could, counting the value of the seed for feeding purposes. The testimony of the planters of Louisiana, as well as persons from almost every other state, as to the value of our products must make Minnesota an export State on her fine products. Among many orders for syrup was one for Stockton, Cal., for fifty gallons, with a view of supplying that city with Minnesota goods. This convinces me that with thorough organization and working to raise the grade, and with the same concert of action that our dairy people have, we can make an article that will not depend entirely on a home

market, but will bear transportation. It is only in such a place as the World's Exposition that we can learn the position that we, as a State, are entitled to. From conversation with others engaged in this industry I learn that Minnesota amber cane yields nearly double that of the Southern States and that the quality is the best. It is to be hoped that cane growers will keep a sharp lookout after this industry, which has been shown to be able to secure a commanding position in the markets of the world."

MINNESOTA.

The following address was delivered at New Orleans by Gen. J. H. Baker, and should be read and studied. It is a masterly and truthful statement of the vast resources of our grand State:

There is an aristocracy in nature, as among men—the loftier mountains, the grand old oceans, the greater planets—which challenges our admiration and commands our homage. So among rivers, there are great names like the Danube, the Nile, or the Ganges, the very mention of which fills the imagination and tells of empires washed by their waves. To-day we stand by the "Father of Waters," which God hath made the artery of a great continent. Young empires deck its shores as it meanders through nearly every zone which belts the globe. Bright intelligences with all the higher aspirations of life, with all the brighter forms of civilization, have come to people its shores, as if indeed "time's noblest offspring was the last." As this proud river flows onward in its march to the sea, it bears upon its bosom the bounties of nature and the productions of art for interchange between one state and another, thus forming a highway for common benefits and interest; a link creating ties and relations alike natural and reciprocal, the people so located can never feel indifferent to each other. One government, one policy, one interest, one prosperity is their probable destiny. A misfortune or a folly might prove the equal injury of all. If there were resentments let the waters of this river forever wash them away.

The Mississippi is our common inheritance. Its fountain is ours; its waves to the ocean are yours! Rising at the feet of the forest pines of Itasca, it pursues its way, now in wanton meandering, amid glens and rocks, again widening into picturesque lakes.

or foaming over cascades, gathering volume as it flows, it descends into the plain, irrigating a thousand meadows, or massing its waters for strength, plunges over rapids and falls, driving the wheels where the skill of man works out the polished products of civilization; at last gathering its great family of rills and rivers into one superb channel, mature, deep and strong, it bears upon its stately bosom the commerce of the West. It seems designed not alone for the drainage of empires, but for the uniting of the people on its shores into a single community of interests and destiny. Unlike as are the productions of its varied zones, this very diversity is a bond of union, for it substitutes inter-dependence for rivalry. Its social conditions, too, are not the least of its benefits. While we may fly from the protracted rigors of a northern winter, you, with reciprocal purpose, can leave the enervating summer's heat, and find the roses of health among some of the thousand lovely lakes that ornament our State.

Between the summits of the Alleghany mountains on the east, and the Rockies on the west; from the watershed of the continent at Itasca on the north to the great gulf on the south, covering twenty degrees of latitude and thirty of longitude, lies the mighty valley of the great river, a continent in itself. Unsurpassed in the variety of its soil and productions, it is the garden of nature. Superb in the noble character of its scenery from frost to flowers, it is in itself a poem. With the exception of the Amazon, no valley on the globe will compare in size with that of the Mississippi; and in its infinite resources and adaptation to the support and comfort of civilized man, it surpasses all others. Even the fabled Nile dwarfs in comparison with the opulence of this marvelous valley. It has more than doubled the productive power of the United States. It has given an opulence to the West which baffles competition. It steadily rises in the scale, and with fresh resources astonishes the world. It is the donative of a new and individual power to the republic, equal to a hemisphere in its incalculable abundance. Around this river cluster impressive memories, from the days when the intrepid Ferdinand de Soto discovered its waters, or a century later when Marquette beheld its sources, till the hour when this exposition opened its doors to receive the polished products of the civilized world.

Youngest of all the states which border this illustrious stream, Minnesota presents herself to you, her eldest sister. Within the memories of you here present our State has developed from barbaric solitudes into a well organized and equipped republic.

That we are here to-day with a collective exhibit of which any people might be proud, with but twenty-seven years of statehood behind us, is indeed a miracle of creation. We represent a million of kindred Anglo-Saxons, who upon the fertile lands of Minnesota, are working out the problems of American life. We exhibit to you the evidences of our activity, the witnesses of our resources.

Minnesota has sought to align herself with that universal spirit of progress which marks the last decades of the century. We trust that our works which are before you are expressive of the aims of an intelligent and growing people.

Let us examine some of the elemental factors upon which we base our claim to the confidence and regard of our competitive sisters. We invite the most critical examination into the condition of our commonwealth.

The agricultural resources of a people is one of the means by which we measure the importance of a state. The power to produce for consumption and a good round surplus is a wealth creating power. Here is a statement from the official ledger, revised for this occasion: We raised during the year 1884 of wheat, 44,307,000 bushels; of oats, 36,100,000 bushels; of corn, 25,630,000 bushels; of barley, 8,618,000 bushels; of potatoes, 7,000,000 bushels; of tame hay, 2,627,000 tons; of wild hay nearly 2,000,000 tons more. These figures illustrate our resources. The average of corn was thirty-seven bushels per acre. That we are a corn producing State is evidenced by the fact that the department at Washington, in the report for 1882, shows that Minnesota leads Iowa, Missouri, Wisconsin, Illinois, Indiana and Ohio in the per acre average of its corn crop.

Consider in this connection how little of the 54,000,000 of acres which comprise the total area of our State are yet under cultivation. About 8,000,000 only are improved, and, deducting our lacustrine regions, but one-fifth of our land is yet in use. About 100,000 farms are now equipped and in running order.

The grand cereal, wheat, has reached the meed of perfection in our State. That spring wheat should supercede winter wheat in the quality of its flour product is one of the surprises that Minnesota has given to the country. The plump, deep amber berry of our Fife spring wheat, richer in gluten than any other, has contributed a noble share in the prosperity of our State. The royal exhibit made at this exposition certifies to the perfection of the Minnesota Fife wheat. This great fact stimulated

its growth, and the grand result is shown in creating for Minneapolis and Duluth the largest aggregate of actual business in this cereal of any cities in America, New York alone excepted. Its milling properties are superior to all others, as it has given name and fame to the finest brands of flour in the markets of the world. The combined results of these great facts has been to give our State, in the city of Minneapolis, the greatest milling centre of the world. Twenty-seven establishments, with an aggregate capacity of 30,000 barrels of flour per day, is a superb and solid fact in commercial life. Minneapolis in eight days can grind enough flour to supply all the people of New Orleans for a year! A city that can make 6,000,000 barrels of flour in twelve months should be mentioned with respect at every breakfast table in Christendom. The total milling capacity of our State is about 60,000 barrels per day, and the total production in 1884, was about 8,800,000 barrels. In addition to this there was 250,000 tons of mill stuff worth \$2,250,000. The last milling year, Minneapolis alone sent 1,500,000 barrels of flour to Europe, and the rest of the State nearly 1,000,000 barrels more.

But it is the wise diversification of her crops and products that have recently accelerated our growth and development. We have fortunately reached that period when one interest no longer overshadows all others, but where each is the correlative of the whole, framing the beams and girders of a commonwealth, solid and self-sustaining. The exhausted era of wheat has given away to the era of diversification. No cereal is king, but corn, oats, flax, barley, rye and sorghum are new and powerful factors in our agricultural wealth. Above all, grass and the honest cow are at the fore. Our State is the fruitful mother of the most nutritious grasses. It is now fully demonstrated that timothy, clover and blue grass are as "to the manor born." Herds of noble cattle are everywhere to be seen. Stock raising and dairy farming, together with flocks of well bred sheep and well rounded hogs, ennoble the pastures of our progressive farmers.

We have herds of Shorthorns, Jerseys, Polled Angus, Herefords and Devons, which cannot be surpassed in the United States. Our ability to compete with the best butter makers of the world is demonstrated by the meritorious exhibit we have made at this exposition, where Minnesota captured twenty-one butter prizes, including the grand sweepstakes and gold medal. A lady of our state, Mrs. N. P. Kelly, has elevated butter into the realm of the fine arts. Her delicate touches and artistic finish

have moulded it into blooming flowers, with delicate tracery, as with the chisel of a Phidias. There are about one hundred creameries in operation, many of which are large establishments. The butter product of 1883 was about 22,000,000 pounds, and of cheese 750,000 pounds, yielding a sum of fully \$1,000,000.

The butter prizes taken at this exposition mark an era in the history of our State. They are but resulting incidents of great fundamental facts. There was no element of chance in these awards. They flow from certain prerequisite conditions—the quality of grasses, the purity of water, climatic conditions and skill in manufacture. Butter is now as scientifically tested as sugar. There can be no mistakes. In the taking of this sweepstakes premium our butter came in competition with the first premium butter in every class, including creamery, dairy, local and all others. The competition was abundant and severe. The judges were experts from all parts of the country, and satisfactory to all exhibitors. The packages examined were stripped of every mark of identification and the severest tests were applied. What we won we won upon merit. And it is here worthy of remark that the only other package claiming almost equal merit was also from Minnesota, presented by N. Olsen, of Spring Valley, and which lost the sweepstakes prize by only half a point. To W. H. Patten & Co., of Le Seuer, belongs the distinguished honor of receiving the grand sweepstakes prize, with a gold medal and \$150 in cash. The stimulus which this great result will give to a growing and noble industry in our State will alone amply compensate for all the money we have expended in this exposition. The total amount of dairy premiums awarded to Minnesota was \$1,589.50. In cheese we took four premiums, with only two factories represented.

The timber interests formed one of the earliest and most solid interests of our State. It employs millions of capital and thousands of men. It has built up parts of the northern portions of Minnesota with energetic and prosperous towns and villages. It has inspired the building of railroads. We have not less than two hundred and forty-five sawmills in the State, and many of these are among the largest in the world. Some idea of the extent of this industry can be had, when I state that in 1883 we cut more than one billion of feet, and very nearly the same in 1884. This does not include the enormous output in shingles and lath. The total value of this yield is put at \$17,000,000.

Nor is Minnesota wanting in true mineral wealth. She pos-

sesses on the north shore of Lake Superior a region of eruptive, igneous rocks, with tabular masses of trap, slates, granite, conglomerates, gneiss, and indeed the whole metamorphic family, wild in their grandeur. This is in strange contrast with the agricultural areas of the State. Here is one of the greatest iron deposits of the world. Hard, specular hematite, or the true Bessemer iron ore, is found in limitless quantities, breaking the trapean crust through ninety miles of territory, and to which already a line of railway has been constructed from the great lake, giving rise to new towns and new and substantial industries. Beyond this, there has recently been discovered veins of argentiferous quartz, richer than that of Silver Islet, which, twenty years ago, gave a Monte Christo celebrity to a little rocky island off the shores of the great lake. It is also to be recounted that since last September as much as two entire townships of this metaphormic rock in this region have been entered by experts as gold bearing, and men and machinery are now at work opening mines, whose fabled wealth is as much a revelation to ourselves as to the world at large. Copper mining has recently begun in the same region with great promise. Mica, porphyry, plumbago and pyrites are abundant. Indeed, the whole north shore, once supposed to be the only worthless region of our State, now promises to be the richest, and this mineral region has special value by reason of proximity to Lake Superior, affording inexpensive transportation.

This summary of our resources would be incomplete without some reference to the wonderful stone formations and varied clays of the state. The beautiful stone shaft which lifts itself nearly forty feet in height before you, correctly represents the varied and consecutive stratas of the extended formation from which it was taken at the city of Mankato. The thickness of the strata, its ability to sustain pressure and withstand the corroding influence of the elements, the pink-tinted stone, in juxtaposition with it, at Kasota, so well calculated and celebrated for decorative work; but above all the marvelous deposit of hydraulic cement rock, west of Mankato, which is admitted by experts to be the most tenacious of any natural cement rock—these combined make this one of the most remarkable families of limestone known to the world. The manufacture of this cement is in full operation, and its approved merit is causing it to supplant even the artificial Portland. This, with the rich families of clays, such as the fire brick, porcelain clay, clay for tileing and pot-

tery, which are widely scattered over the State, complete a rare aggregate of permanent values. To these must be added the splendid granites of St. Cloud and sandstones of Duluth, with many and varied deposits of blue limestone, which complete the endowment of the State with a wealth of rock and clay equipment.

To make by labor and art the machinery, the cloth, the lumber and its products, to form, fashion and fit for our use the varied raw materials, is the highest mark of a self-reliant and thrifty people. This is the super-structure which, reared upon successful agriculture, builds the solid prosperity of a State. Our manufacturing power increased the past three years over one hundred per cent, and with abundant raw material, and the cheapest of motive powers, our manufacturing future is secure. Upon no equal area of territory has nature been so lavish in providing water powers. The aggregate of these waterfalls is beyond belief. Their individual force is such as to merit mention. St. Anthony Falls equals 135,000 horse power. Sauk Rapids, Pokegama, Little Falls, the rapids of the St. Croix and the Dalles of the St. Louis will each average 90,000. There are twenty-seven others well distributed and worthy of mention. This combined power would turn the wheels of the industries of the United States. They are incentives to the fabrication of all our raw material. We have not only the motive power, but abundance of cheap material to give these tremendous forces proper employment. They invite to enterprise, and are a wealth creating power.

In vegetable products we take a great pride and a position of just supremacy. It may appear an humble thing here to-day among these splendid works of art, pictures and statuary, silks and carving, to speak of potatoes, turnips, beans, cabbages, and peas. But good, sound table vegetables are mighty factors in the health and contentment of a people. They could subdue a hungry mob or give freshness and valor to an exhausted army. Not unwisely did the Roman mythology place Ceres in the rank of the higher divinities, as the sister of Jupiter. With her basket and hoe she leads Mars and Apollo, Bacchus and Vulcan in the procession of the gods. So good, sound, well-flavored vegetables should take front rank in the essentials for civilized peoples. And such Minnesota possesses, luscious in flavor and rich in their perfection.

FRUIT IN MINNESOTA.

Our adaptation for fruit must not be overlooked. There are many States here represented hitherto justly celebrated in pomological fields. That among them such a Northern State as ours should presume to appear as a competitor, certifies her varied resources. In 1883, at the exhibition of the American Pomological Society, in Philadelphia, Minnesota was awarded the Wilder silver medal for her collection of apples. Our horticultural display at this exposition attests afresh our pomological wealth. All doubts as to our being an apple producing State are removed. In 1884 we produced over 200,000 bushels. We have contributed several original apples, such as the Wealthy, to enrich the world's list of this royal fruit. The solidity and flavor of our apples and berries confirm their excellence, and give bright promise of future varied and profuse development. Cultivated grapes flourish well, and 300,000 pounds were reported as the product of 1884. Out of these good wine is produced. Minnesota was awarded at this exposition eleven premiums and three silver medals for best grapes east of the Rocky Mountains. In all the varied family of berries and plums, ours cannot be excelled in the quality of their flavor and relish. Diversified horticulture is one of the permanent and attractive industries of our State.

In this brief citation of mixed agricultural industries, the importance of sorghum must not be overlooked. The sorghum exhibit Minnesota has made and is here spread to your view, of sugar, syrup and candies, is more than a suggestion of great possibilities. It is a direct invasion of that saccharine field heretofore solely awarded to the tropics. That we should compete with Cuba, Mexico, and Southern Louisiana in such a production is surely the unexpected. By the manufacture of ice you have taken from us a native product; we make the law of equivalents good by saccharizing the juice of the sorghum. Both in sugar and syrups our northern State has done nobly, having captured the first premium for best amber cane syrup, and first premium for best amber cane sugar, with strong competition from every portion of the country. Minnesota has thus demonstrated that the sugar line can be removed eighteen degrees of latitude northward.

The crowning glory of our State is her superb system of public and higher schools. The wisdom of Minerva could not have pointed out a nobler policy for the State than that which opens

the door for the free education of her children. Minnesota believes that the common school lies at the base of the problem of self-government. The remarkable and unrivaled exhibit of her school system now before you attest their high character and excellence. At the beginning the munificence of the national government equipped the State with a dowry of lands princely in extent. The sixteenth and thirty-sixth sections in each township are devoted to this purpose. It gives us a grand total of 3,000,000 acres, an area equal in extent to the State of Connecticut.

This grant has been husbanded with tender care. The permanent school fund already amounts to \$6,500,000, and in the future will fully realize \$20,000,000. Besides the income from this fund we raise annually about \$2,500,000. The State has 223,209 enrolled pupils. There are 4,671 school houses, 4,802 common schools, with 6,086 teachers. These teachers were mostly educated in our normal schools, of which the State has three, with a present attendance of 1,375 pupils. As part of the common school system we have 250 graded schools, of which sixty have high school departments, in as many cities and towns, in which students are fitted for the university. The kindergarten system is in operation in all our leading cities. The eighteen public school buildings of St. Paul and the twenty-three of Minneapolis, costing from \$25,000 to \$75,000, unique in their architecture, complete in their equipments, thorough in the systems and methods there in use, and with their 22,175 attending pupils, are probably without a rival in the cities of equal proportions on the globe.

There are six colleges under denominational control, one medical college and three theological seminaries. The State university justly ranks as one of the great universities of the country. It has an able corps of professors, of high repute, and its curriculum covers all the branches of science, literature, languages, mechanic arts, agriculture, and medicine as taught in the foremost universities of the world. Take it all in all, we proudly say that we do not believe that there is any other community better equipped with a system of seminaries of learning more complete, symmetrical, and thorough than the State of Minnesota.

We may justly measure the commercial value of a state by its railways and waterways. How well we are furnished to meet the imperious demands of a commercial age, let facts attest. Nine great railway corporations serve every portion of the state

with good railway facilities, with road beds and equipments which have no superiors in the United States. Our 4,280 miles of railway, considering our area and population, make us as well served as any other state in the Union. The great dual cities of St. Paul and Minneapolis, at the head of navigation of the Mississippi, make the third chief railway terminal point in the country, Chicago and New York alone excelling. The country thus made tributary to Minnesota and its commercial cities, as the gateway to the commerce and trade of the Northwest, is a region greater than all New England, New York and Pennsylvania combined, and gives a field such as cannot be paralleled in any other state. Here terminates the Northern Pacific transcontinental line. Here too gather the great waterways, on the apex of the continent, equidistant from Hudson's Bay and the Gulf of Mexico. We possess unobstructed navigation to the great gulf on the south; through the "unsalted seas" to the Atlantic on the east; while the upper Mississippi and the Red River of the North cheapen transportation through a fertile zone. Engineering science predicts a grand waterway through our charming lacustrine regions, connecting the Red River with Lake Superior. With such a network of railways and vast waterways centreing in Minnesota, nature and art have united their forces to cheapen transportation to its possible minimum.

We might inscribe upon our shield that we are a "terminal state," and invoke that god Terminus, whom the Romans set up to mark the limits of empire. Here ends the western trend of the waterways of the St. Lawrence and the great lakes; here begins the navigation of the Red River of the North; here closes the navigation of the "Father of Waters;" here is the limit of the United States railways, stopping at the line of the Dominion of Canada; here is the eastern terminal of the Northern Pacific. Those conditions have given to the state and its commercial centre, St. Paul, a phenomenal growth. We stand at the gateway of the Northwest to toll its wealth. We are but in the early morning of this exciting drama. The prolific power of a cereal empire, the cattle upon ten thousand hills, fabulous mineral resources, and a thousand wealth producing elements; these, under the creative energies of Anglo-Saxon civilization, are the mighty forces which stand as sponsors for our future growth and greatness. The sober judgments of men are made almost incredulous by the immensity of our resources.

A BRIEF OF HORTICULTURE IN MICHIGAN.

Mr. C. W. Garfield, secretary of the Michigan State Horticultural Society, has kindly furnished us with advance sheets of his report for the year 1884. We make a few extracts, which will not be without interest to Minnesota horticulturists, and many of the suggestions made will apply with almost equal force to the climate, soil, and productions of our own favored State. He says:

“We have no immense wheat fields nor gold mines, nor mountains of iron, nor is our land extravagantly fertile. Cotton is not king, nor is corn queen. In truth we acknowledge no royalty in any one product. But we have a nicely adjusted diversity of products, leading to a great variety of industries, which renders us capable of maintaining a large and prosperous population. We supply our own needs to a very large extent by patronizing the producers and manufacturers within our own limits; and while doing this we need not be without the luxuries of life produced at our very doors.

“Michigan is emphatically a State in which to build homes; independent, attractive homes, in which is engendered a spirit of rest and satisfaction that gives permanance to population and continuous prosperity to the inhabitants. It is very largely to the growth of horticulture in our State that we have these conditions so well developed. Bonanza farming would add nothing to our prosperity. Small farms that are readily converted into delightful homes, by bringing into them the refinements of education, and about them the attractions of modern horticulture, will be the foundation of Michigan's future prosperity. We have outlived the stories of ague swales, barren hills, and sandy plains. We show by our products, our people, and our standing among the states that we need no forced advertising; and we will frown down all attempts to deceive people by leading them to think that we have a country in which capital and hard work are not the price of success.

“One needs but to glance over the wide range of forest products of our State to learn the influence of our peculiar climatic conditions upon the number and diversity of plants that succeed in our State. In cultivated and introduced economic plants employed by horticulture, this same wide range of species is noticeable. In the same county which, under favoring circumstances,

ripens the fig and develops the most perfect peaches, we find the apple in its greatest perfection. Ornamental plants that have to be protected during severe winters with the greatest care, in the climate one hundred miles south of our State, remain openly exposed upon our western shore without harm.

“From quite accurate data I have estimated the sales of apples from Michigan the past season at 5,000,000 bushels, at prices ranging from one dollar to two dollars per barrel. The area in fruit cannot be less than 300,000 acres, and the planting, especially in peaches and small fruits, is rapidly increasing this area. The question of whether we are not going to overdo the growing of fruit for market, very often arises among commercial orchardists, and low prices in years of plenty stimulates the inquiry. But one only needs to go into the great and developing Northwest, where but few of our fine fruits can be grown at all, to get a satisfactory reply to the query; and those who complain of low prices for orchard products need only to compare aggregates with any other farm products to become satisfied with their orchards.

“But the best returns that horticulture in Michigan promises its devotees are not those that rattle in the pocket or swell the bank account. They accrue from the diversity of fruits that can be easily grown with slight expense to furnish the needed supply for a family throughout the year; from the delightful turf that may be so readily grown about the buildings; from the attractive shrubs, annual and perennial herbaceous plants, that may be brought to administer to the pleasure of living a large portion of the year; from the evergreen and deciduous trees that can be grown in so great variety, and which add such charm to premises.

“Rural life in Michigan, with the delightful climatic privileges, and the multitude of things that may be made to contribute to a charming country home, contains within itself profits that cannot be indicated by the dollar's sign. If they do not swell the purse, they contribute largely to the wealth that is rolled up in a full manhood and womanhood, in a happy childhood in a complete home,—where the question of what are we living for, never finds an opportunity to be propounded.”

A writer from Stevensville, in Southwestern Michigan, says:

“Berrien County is located in Southwestern Michigan, and has a coast line extending forty miles along the east shore of

Lake Michigan. Climatic influences, caused by the large body of water on the north and west, with a great variety of soils and facilities for cheap transportation, have, within the last twenty-five years, developed commercial fruit growing interests of a greater magnitude than in any other locality in the Northwest.

"During the past two decades the production of the finer varieties of Michigan fruits has not been commensurate with the demand caused by the growth and expansion of the cities and towns of the Northwest.

"Large plantations of apples, alternating with peach trees, were made by the early planters. As anticipated, the apple has outlived the peach, leaving large apple orchards, which often consist of varieties which are not profitable to grow upon soils, and in a locality where peaches and the finer varieties of fruits will always be profitably grown. Our cheap transportation facilities will, however, warrant the growing of the early and beautiful varieties of apples for the Chicago market. All of the lower peninsula of Michigan is adapted to the perfect development of the apple, and, with the exception of occasional years, of general, exceptional production, apple culture must continue to be one of the leading and remunerative industries of the State. The experience of recent seasons has proved that many varieties, which were once popular, are becoming unreliable and worthless.

"It is generally conceded that the most perfect fruits are grown at the extreme northern limit of successful production. During a long time commercial fruit growing in the Northwest was confined to the St. Joseph region; but as the country north of us contiguous to the lake shore has become developed, peach growing has become more diversified, and Berrien County has made a specialty of small fruit growing, while the old peach orchards have decayed.

"Grapes are extensively grown, nearly all our fruit growers having small vineyards which aggregate several hundred acres in the county. The Hartford, Concord, Delaware, Diana, and Catawba are the principal varieties grown, but many new varieties are being introduced, among which the Champion and Niagara are the most promising for market. Mildew and rot prevail some seasons in a few localities, but large crops are marketed annually in Chicago, the prices ranging from three to ten cents per pound.

"With our location and soil and proximity to Chicago, and

with cheap competitive rates by boats and rail, which take our fruits late in the evening and place them on the market early in the morning, Berrien County has not, and never can have, successful competition in the production of small fruits by localities which mature these fruits at the same time in the season. Small fruits have become a necessity to the inhabitants of the civilized world; and while the North craves the early fruits from the sunny South, we are enabled to return the favor, and to supply both North and South with a succession of fruits until we again greet the strawberry from the Gulf states, while the snows upon our fields are melting from the buds, which always produce a sure harvest. Berrien County has in bearing about 7,000 acres of small fruits, about 4,000 acres being in strawberries and the remainder nearly equally divided between blackberries and raspberries.

"Fully nine-tenths of our strawberry fields are Wilson's; this variety still holding the first place with large planters for distant markets. The Sharpless is growing in favor with Chicago consumers, but will not bear reshipping, and is extremely sensitive to frost during the blooming season. The Crescent and Manchester stand next, but pistilate varieties are not popular with our growers. Many new varieties are being introduced, among which the ideal market berry may be found.

"The Turner has been the leading red raspberry, but is giving place to Cuthbert, Reder and Brandywine, all of which are better berries for distant markets, not requiring every-day picking and can be picked much cheaper. Shaffer and Ohio are good for canning and for near market, but are too dark and soft for our markets. Gregg is considered the best blackcap, but black varieties are not as popular as formerly with grower or consumer.

"Melons, asparagus, and many vegetables of the best quality are profitably grown for the Chicago market, but southern points supply the market early in the season, and large market gardens are cultivated in the vicinity of Chicago.

"It is about twenty-five years since persons desirous of following pomological pursuits began to be attracted to this locality. The most of the lake shore country is now occupied by fruit farms, which average about twenty acres each. Prices of these farms range from fifty to three hundred dollars per acre."

President Lyon, of South Haven, on the shore of Lake Michigan, writes:

“As in other pursuits, persons have, not unfrequently, embarked in fruit growing, here, with too little knowledge, means or capacity for the business, and have, for such reasons, failed to make it profitable; while others, under more favorable circumstances, find it pleasant and in many cases, highly profitable. Lands in good condition, in bearing orchards, with the needful buildings and other fixtures, and convenient to the points of shipment are considered worth as much as two hundred to three hundred dollars per acre; while good but unimproved fruit and farm lands not very remote from market may be obtained for twenty-five dollars per acre — possibly even less. Good improved land, suitable for fruit or truck growing, may be had at one hundred dollars per acre in the immediate vicinity of the town.

“As an instance of profitable horticulture, one of our oldest and largest peach growers realized \$13,000 as the net proceeds of the sales of the year 1873. From which sum he deducts \$3,000 for cost of production, leaving the clear proceeds of the year \$10,000. In 1874-’6-’7-’8 and ’9 his net sales ranged between 10,000 and 20,000 baskets each year, the clear proceeds, after deducting the expense of production, averaging \$2,000 to \$3,000. These are the proceeds of about eighty acres of bearing peach orchard.

“Red Astrachan, Oldenburgh, Maiden’s Blush, Lowell, St. Lawrence, Hubbardston, Westfield, Rhode Island Greening, Baldwin, Red Canada, Golden Russet, and Roxbury Russet are the leading market apples; while nearly all northern varieties, whether eastern or western, are found to succeed perfectly here. The net incomes of a well managed orchard for a single year, when in its prime, may well be so large that even a correct statement might endanger a reputation as to credibility. Such net income should be arrived at by taking the average of incomes for a series of years, reckoning from the date of planting, and continuing during the life of the plantation. Nothing short of this will afford a proper comparison as between orcharding and ordinary farming. A critical knowledge of varieties and modes of management is of the highest importance, since mistakes at the outset are very difficult to remedy.

“The borer in the tree and the codling moth in the fruit have, so far, been the most troublesome insects. There is apparently little danger that apple culture will be overdone. The demand for apples is apparently increasing more rapidly than the supply;

owing, apparently, to the extensive settlement of new and non-apple growing regions.

“Concord grapes are at present more extensively planted than any or even all others; but Delaware is by some regarded as nearly or quite as profitable. For an early grape, Moore’s is acquiring a high reputation; also a few early plantations of the Niagara are now in bearing, with indications that it may prove highly desirable as a market variety. Mildew of both foliage and fruit has, in some seasons proved troublesome, and the same is true of the premature rotting of the fruit. The minimum price at which grapes can be grown with any profit is about one and one-half cents per pound. Plants are trained both to stakes and trellises, some preferring the one, and some the other; but the usual mode of pruning is best characterized as *no system* — to leave an amount of bearing wood, depending upon the judgment of the pruner at the moment. The quality of the product, and perhaps even its quantity might, no doubt, be decidedly improved by the adoption of an improved process in this respect. The soil is usually cultivated by a shallow plowing in the spring, after which the cultivator or harrow only is used. The soil is not usually disturbed after an early date in August, as thus the young wood is found to mature more perfectly. Pruning is usually done in November, or from that time to March.

“Strawberries are usually grown here in matted rows, but the production of finer fruit under a more efficient system is believed to be decidedly more profitable. Red raspberries are believed to be more profitable in this vicinity, owing to our milder winter temperature, and their consequent exemption from injury at that season. Still, blackcaps are extensively grown and highly profitable. Blackberries are very extensively grown, and rarely fail to produce a full crop; but since the crop is diminished by even a slight injury to the tips of the canes, it is found safer to plant the more hardy varieties.”

Prof. Satterlee of the State Agricultural College says:

“Apple orchards are uniformly most successful on good strong upland that had originally a good sprinkling of oak timber. Some orchards have been set upon a dark colored, loamy soil, underlaid within a few feet of the surface with a wet quicksand. On such soil the trees have grown rapidly for a few years, but have killed badly in severe winter, and the trees that still sur-

vive make very poor returns. Such soils should be always avoided for orchard purposes.

"Some orchards, I have observed, that make a good annual growth and bear full crops of fruit, are pastured very close with hogs or sheep, and by pastured very close I mean kept constantly gnawed down to near the surface of the ground. A large proportion of the codling moth is destroyed, and trees are not sapped by the evaporation that a rank growth of long grass produces. Other successful orchards are cropped with a rotation of crops the same as other parts of the farm, and by judicious fertilizing are kept in good thrifty bearing condition. There is every encouragement for the careful grower to plant young orchards. Nearly all the old, neglected orchards are going to decay, and will soon be gone, while the young trees of the best and most popular varieties are doing well.

"The grape succeeds admirably except in an occasional season when frost destroys the crop. The Concord is sometimes troubled with the rot, but is usually very healthy. The Delaware, the Wilder, the Worden, the Brighton, and many other varieties are quite uniformly successful. The vineyards are kept well cultivated, and the vines trained upon wire trellis, of from one to three wires. Where a single wire is used the vines are trained with a single horizontal arm three and a half feet from the ground. Where more than one vine is used, the amount of new wood left for the production of fruit is in proportion to the vigor of the vines. If very strong in their growth, from four to six canes are left with from twelve to twenty eyes each. The fruit is usually marketed in baskets holding from fifteen to twenty pounds each. In good seasons it can be grown at a profit as low as three cents per pound."

A correspondent writing from Ottawa County, says:

"Lands are not exceedingly high. Improved places, fairly stocked with fruit, can be obtained for seventy-five to one hundred dollars per acre, and wild lands, some distance from market, can be purchased very cheaply. As to profits, one man grew 5,000 quarts of strawberries on less than an acre of land, for which he received five hundred dollars; 1,700 quarts were harvested at one picking. Another man clears about \$2,000 a year on a small fruit farm near Grand Haven."

S cretary Garfield closes his "Brief" as follows :

"In conclusion allow me to say that I have not been able to give the time to gathering the preceding facts that the importance of the work demands, but have sought to give the various sections of the State some representation without too much repetition, to gather in shape to be easily reached, facts concerning the progress of horticulture in various parts of the State. Many localities have not been touched, owing to the little time that could be given the matter, but I trust that in future numbers of the Michigan Horticultural Report added statistics will appear, from year to year, as the aggressive horticulturist shall reach into new fields and record his success and failures. The position of Michigan with regard to the great Northwest, her mild climate, and success in growing fruits, will always give her great prominence as a source from which to supply a large area with the most luscious fruits of the soil. The great question remains to be solved, whether her people will save her climate, and preserve her prestige by a judicious preservation of the forest growth, and the addition of new plantations, where the axman, like a demon of destruction, has attempted to sacrifice the future of a State to supply the present demand of the thoughtless, unscrupulous seekers after riches."

GROWING SMALL FRUITS AS A BUSINESS FOR WOMEN.

PREPARED BY M. CRAWFORD, OF CUYAHOGA FALLS, O.,

For the annual meeting of the Mississippi Valley Horticultural Society, held in New Orleans, January, 1885.

It seems to be according to the order of nature that man should face the world boldly and bravely, rather seeking than avoiding its bustle and competition, but that woman should be defended from the rough experiences of life by the stronger arm of a husband, father, brother or son. Were she always thus happily situated there would be no necessity for planning what woman can do,—not that she should lead a useless life, —no person who is able to work has a right to be idle,—but when woman keeps the home, and attends faithfully to the demands of those vocations which are suited to her, she does her fair share of the world's

work. We all know, however, that even in this favored land very many women are dependent upon their own exertions for a living; and not only this, but many, besides caring for themselves have others looking to them for support. How to provide for these is a serious question.

There are many remunerative occupations which are closed to woman by reason of her want of physical strength. She cannot well engage in agriculture. There is much heavy work connected with it which she cannot do herself, and if she attempts to hire it done the proceeds will often fail to pay the help. Market gardening is open to the same objection, and both have the added drawback of requiring too much capital.

She cannot find employment as a common laborer. Aside from the barrier of lack of strength, she could not engage in such an occupation without losing much that makes her womanly, and being reduced to the level of a beast of burden. This cannot be done in the United States without a radical revolution in public sentiment. She cannot learn the mechanical trades, nor engage in mining or lumbering, or railroading.

When she turns her attention to the lighter avocations the case is but little better, for though she may get a situation as clerk in a store, or operator in a telegraph office, or other similar positions, she must be content with half pay. She may have all needed ability, perfect integrity, and a determination to render good service, but she must do for five dollars a week that which a young man—too effeminate and genteel to work, too ignorant to enter a profession, and too poor to engage in business on his own account—will receive ten or more. We have an opinion of these ambitious young men who aspire to measuring tape, dress-making, or any other light work that a woman could easily do.

When the professions are considered as a means of livelihood, woman is virtually shut out. A very few of her sex have studied law and been admitted to the bar, and a few have entered the ministry. Some have studied medicine, and are doing a noble work in their chosen profession. Still, the number who can engage in the law, the ministry, or the practice of medicine is so very small that the professions seem hardly worth counting as avocations upon which women can depend.

It is conceded on all hands that women are naturally adapted to the work of teaching, and the number of those who take it up is rapidly increasing; but here again they are subject to the galling injustice of seeing men receive much higher pay for the

same work. Even the principal of the high school in so large and enlightened a city as Cleveland, Ohio, asserts that men should receive better salaries than women for teaching, because they will not work for the same. They demand more, therefore they should receive more.

We hear much about the avenues that are open to women at the present day, but look at the subject as we may, they have not an equal chance with men. Besides being shut out of many occupations by physical incapacity, and working for inferior pay in many of those in which by superior fitness and faithfulness they have gained a foothold, they find themselves elbowed by men, even in those avocations which belong especially to them, as, for instance, millinery and dress-making.

But there is a pursuit in which very few women are as yet engaged, which offers more advantages with fewer drawbacks than any other to which she can turn her attention. This is the cultivation of small fruits. The leading characteristics of this work are such as to recommend it especially to women.

It is not laborious; does not require great physical strength, and yet it furnishes proper and plentiful exercise for both mind and body. There is but little heavy work connected with it, and that little can be hired. It does not require much capital. But little land is required, and no expensive implements. When the business is begun in a small way, and gradually increased, there is scarcely any expense worth naming.

Fruit growers meet with less competition than almost any other class, and next to none from coarse or ignorant people. Their products generally meet with ready sale, and here, for once, woman has an equal chance with man. When she sends fruit to market no one demands it for half price because it was grown by a woman.

Fine fruit sells on its own merits, and while it has no fixed value like wheat, a good article is always in demand at a paying price. No advertising is needed to sell it, and no money is spent in building up a trade. It can be grown in any part of the country, and there is a market for it wherever people live. The demand for fruit is not based simply upon its being delicious and attractive; it is a real need. The human system has a natural appetite for the combination of acids and sugar that is found in berries.

When we think of the thousands and millions of people who live in cities and raise nothing, we partially realize the extent

of the demand for fruits, and the conclusion is that for a long time to come the demand will exceed the supply. True, the market is sometimes overstocked for a day or two, but in such a case the producer can dry or can the surplus. The market for dried fruit is never overstocked.

Small fruit growers have another advantage in the fact that their products come into market in the summer, when people have money and are liberal in spending it, rather than in the winter, when many are idle, and when those who have employment find that the necessities of life make such heavy demands upon their earnings that they have little left for luxuries.

The advantage of being one's own employer is worth much. No one can fully appreciate this until he has been subject to the call of a bell or a whistle. There is not a single qualification needed for the business of growing small fruits that woman does not possess. Indeed a much larger proportion of women than of men are suited to the work. Farmers in general will let their families go without fruit rather than to raise it, but farmers' wives are interested in horticulture. They raise the flowers, and often the vegetables. They attend to details. They are in sympathy with their pets, and learn their habits much sooner than men do. As a rule they are not so ready to neglect their work as men are. Added to this, they have a "knack" which gives them success. A skilful gardener once said that a woman with a cracked teapot could root cuttings that an experienced propagator with all his modern appliances would fail with. It is not hard work, nor the ability to do hard work that makes fruit growing successful; it is the heart work, the real interest, the carefulness, and faithfulness, and good judgment that are put into the enterprise.

Lack of knowledge is no obstacle, for this can be acquired easily and quickly. There are no secrets in fruit growing. Those engaged in it are always ready to communicate their knowledge, and every horticultural society is engaged in disseminating information.

HINTS TO BEGINNERS.

First—Post up on the work. Study your facilities, your land, capital, nearness to market, and ability to obtain needed help. Secure the control of some good land. It costs as much to prepare and cultivate poor land as rich, and the profits are little or

nothing. Begin in a small way. You will make some mistakes, and will have much to learn. If you do everything well and at the right time you cannot attend to much at first. Plant but few varieties, and only such as generally succeed. You can well afford to do without those new kinds that are "destined to supersede all others." Be more practical than theoretical. Be more ready to believe what you see than what you hear. Take some good horticultural papers, and read them attentively. Join a horticultural society if there is one within your reach. Do your work well. Both profit and satisfaction come from a little well done, rather than a large plantation grown in a slipshod manner. Sell no poor berries. They will injure your credit more than they are worth. Use them, or give them to those who have none and cannot afford to buy.

Keep your plants growing during the growing season. Injure no roots in cultivating. Plants make their own repairs, but they should be better employed. The force expended in healing a broken root might be more profitably used in building up the plant or storing away nourishment for the next crop of fruit.

All the berry plants do best on land that is rich, moist,—not wet,—and cool. Without richness there is nothing to make fruit of. Without moisture to dissolve the food in the soil it is unavailable, for all plant food is taken up in solution. Without a comparatively cool soil the plants cannot remain healthy. Each plant should have plenty of room, and no other root should be allowed to rob it of food and moisture. The surface of the soil must be kept loose by stirring or mulching, so as to admit air to the roots, for they cannot live without it. As a plant can make its wants known only by signs, he who best understands these signs and is most faithful in supplying the wants expressed by them, will succeed best.

The fruit grower is an employer, and each plant set out is an employe, which can accomplish much or little, according to the master's knowledge of its needs, and his faithfulness in providing for them. Each plant set out is an independent establishment, and, if not hindered, will go steadily on, doing the work appointed to it by nature—gathering its food, and changing the raw material, by means of the rain, the sunshine, and the atmosphere, into delicious fruit. It is a pleasant thought that the plants which we set out and care for are so many little helpers engaged in our service, and whether we sleep or wake, whether we are sick or well, they still go on and on with their silent,

busy work. It is the fruit grower's province to see that all the conditions are favorable, so that there may be no interruption of this work. His returns will be in exact proportion to his judgment and thoroughness in this respect. This is a point where knowledge is power.

AMBER CANE.

BY SETH W. KENNEY.

Editor Farm, Stock and Home :

In the first place, it is known that at present almost every village is supplied with amber cane products. This is as it should be; we should raise all such things that pay, as well as the amber cane. The low prices of sugar have operated against the high prices heretofore obtained; but this industry to-day is not as much depressed as the wheat, and from the seed already put out, I can say that the industry has come to stay. Good cultivation, good seed, and good, strong machinery, these three points are all to be observed to succeed. I ought to have said plenty, good, dry wood in addition.

Since my return from New Orleans, and after hearing the remarks and seeing Minnesota taking four first premiums on amber cane goods, it must be evident to all that this cane is to the manor born, and it is an omnipotent factor of wealth to the State we ought not to overlook.

It has been found that *bagasse*, put up in ricks, long and high, and built narrow, will make a valuable fuel for boiling, but it has not proved very valuable used the same season in this climate.

The roots of cane strike deep and bring up from the sub-soil that which will increase the yield of wheat or oats in one season from forty to fifty per cent. This is the testimony of our best men.

The machinery of capacity, to grind one hundred gallons in ten hours, can be bought very reasonable at present, and I hope what the vice president of the Sugar Exchange said may continue to be true, "that Minnesota took an advanced position in this industry."

A great many farmers do not save the seed, and it is so valuable for milch cows it should all be saved. We have found it equal to cornmeal to increase the flow of milk.

If the seed is boiled it fattens pork rapidly. Over one-half of the crop in Kansas is used for feeding purposes. So we see the crop coming to be of great benefit to many and in many ways.

The increased facilities in making sugar by our friend Porter, of Red Wing, is one of the greatest points in my opinion, and the future will witness some great advances in this industry.

Rice County, Minn.

FUTURE OF THE SORGHUM SUGAR INDUSTRY.

BY PROF. WILEY, OF WASHINGTON, D. C.

At the annual convention of the Wisconsin State Agricultural Society, held at Madison, in February, 1884, an interesting paper was contributed by Prof. Wiley, from which we make the following extracts:

"In regard to the future of this industry I will say that as a syrup-producing plant, sorghum cane has already become firmly established; that the product of syrup in the country is already approaching that which the country consumes. I have found that the amount of syrup that was imported into the country during the past year was less than 50,000,000 gallons, while the amount that was made from sorghum syrup in the country during that period was nearly as much. From the best information at hand, the product is almost equivalent to one gallon per head for all the people of the country at the present time. An industry which is already developed to such an extent needs no prophecy in regard to its future; its future is already assured. I will say to the farmers of Wisconsin, sorghum cane is of more importance as a syrup-producing plant, to your State, than as a source of sugar. As a syrup-producing plant it is a certain crop. As you well know there is no more hardy crop than sorghum cane; it will grow in a dry or in a wet season, in a hot season or in a cold season. Of course in a cold season there is some difficulty about its maturity, but it is not necessary in order to make a fair article of syrup that the plant be ripe. In almost any season you can have a crop of sorghum.

The sugar consumed in this country is more than forty pounds per head, and hence it becomes an immense article of consumption. This country does not begin to produce the sugar it consumes. People sometimes think the sugar they get is nearly altogether made in this country, particularly in Louisiana; while the fact is that the sugar made in Louisiana is a very small pro-

portion of the amount consumed. We imported into this country during the season of 1883, according to the estimates, nearly 1,200,000 tons of sugar; while the amount of sugar we made in this country did not altogether exceed 100,000 tons. You see we produce only about one-twelfth of the sugar consumed.

Where does the sugar come from that we import? A great deal from the tropics, from Cuba, and a great deal from the Sandwich Islands, which comes in free from duty, and we are now importing large quantities of sugar from Germany and France. Think of it; France and Germany, a country exhausted by a thousand years of agriculture, no more suitable in any respect for the production of sugar than the United States. The most of the sugar we import is made from the tropical cane, the sugar cane. The sugar they produce in Europe is made exclusively from the sugar beet. In the Sandwich Islands the sugar is made from the sugar cane. In this country the sources of sugar are four: the sugar cane as it grows in Louisiana, producing by far the largest amount of sugar; next the sorghum cane, or the sugar beet, and fourth the sugar maple; these are the four sources of sugar to which we must look in this country.

A few years ago the amount of sugar made from sorghum cane could be numbered by hundreds of pounds. The past year has been a very unfavorable one for the production of sugar, but the total amount produced in this country is not far from 1,000,000 pounds. We may hope with increased skill and means of production the amount or quantity will increase very rapidly. The sorghum sugar factory at Rio Grande, New Jersey, has passed through three years of successful life, producing large amounts of sugar, and the crop has not been injured by the frost. I have taken the records of the signal service and traced a series of isothermal lines which indicate those portions of the country whose climate is the same, as far as heat is concerned, as Rio Grande. The lines run in a northwesterly direction, . . . crossing the Mississippi River near Minneapolis, passing out through Northern Minnesota. The conclusion is that all this vast Northwestern country is as favorable to the growth and maturity of the sorghum cane as the country on the shores of New Jersey. I think all of you will bear witness that the general result is that the early amber cane ripens in this whole region. Ninety days of good growing weather is sufficient to mature the earlier varieties of the sorghum cane. But there is another period as important as that of growth to be consid-

ered. To make sugar profitably requires a large plant. No method has yet been devised by means of which sugar can be made profitably in a small way by each individual farmer. Expensive machinery and extensive labor are required for profitable sugar making. Sorghum cane which has been frozen is almost entirely ruined for sugar making purposes. Although the belt of successful growth extends all over the Northwest, the belt of successful manufacture does not. An early winter is indispensable to a beet sugar country. The beets are harvested and protected in pits from the frost. The beets could be put in silos and worked through the entire winter. Why not preserve cane in this way? I have made one experiment of putting the stalks under ground and covering them up, and it has been entirely successful up to the present time. If the cane can be preserved in this way the manufacturing belt can be extended all through this region.

The demand for syrup in this country is a limited one compared with the demand for sugar, and it will be a long time, under the most favorable circumstances, before the supply of sugar can equal the demand.

The State of New Jersey gives one dollar bounty on every ton of cane grown, and one cent per pound for every pound of sugar made. They did the same thing in France and Germany. Napoleon put this industry on its feet by bounties. It is wise economy on the part of our government to support every weak industry so that hereafter it may become a source of wealth. I believe this country will yet make its own sugar.

DAKOTA HORTICULTURAL AND FORESTRY ASSOCIATION.

HORTICULTURE AND FORESTRY.

We have received a copy of the initial number of the Horticultural Society of Dakota, from which we make a few extracts which will be found of interest.

The Territorial Horticultural Society met in Huron, Dak., on Thursday, Feb. 5, 1885, with E. De Bell in the chair and W. F. Eastman as secretary. The president opened the session with the following remarks:

Gentlemen and fellow members:—In this, which is really our first meeting, we come together to communicate with each other the knowledge which we may have acquired during our brief residence in Dakota, relative to the various trees, plants and fruits, and to relate what is new and valuable in our experiences; to sift the good from the bad, and scatter throughout our Territory such valuable information as we shall be able to gather that may be of service to our fellow men, and prove light-houses upon the pathway of horticulture that shall direct the laborers in this calling forward, until these fertile plains which we have chosen for our future homes shall be clothed with beautiful groves and forests, and orchards bending beneath their burdens of golden fruits, and Flora and Pomona shall lavish upon us an abundance of their precious gifts. These are not mere visionary thoughts, for enough has already been learned to prove that, with careful and intelligent selection of varieties, and proper care, we may rank with any of our sister states, both in quantity and quality. And what of them? Two years ago Minnesota carried off the highest prize at the American Pomological Convention, held at Philadelphia for the finest display of apples. This winter Iowa takes first prize at New Orleans for best display of fruits from the Northern States. And I would challenge the world to show finer apples than were grown in Dakota in 1884. It behooves us as a horticultural society, and as a party that will be looked to for correct information, that we proceed with the utmost caution, and that the work of discrimination shall be such as will direct the planter upon the road to success. The labor that has been performed in this field thus far in our Territory has been carried on by each unaided and alone. Each one has been paddling his own little horticultural canoe upon a broad and unknown sea, and everywhere are placed false beacon lights that lead the frail craft upon the fatal rocks. The greater portion of these false lights have been set by the unscrupulous and unprincipled tree agent, like the pirate of the merchantman upon the high seas, yet unlike him there is no law to punish. Other false lights, though perhaps not intentional, are accountable to the nurseries themselves, who list and recommend for this section varieties that are worthless, and varieties which if not known to be worthless by them, certainly shows an inexcusable lack of information on their part, and causes an irreparable amount of damage to their customers. The loss of money is insignificant in comparison to the loss of faith, and the loss of time spent in planting worthless varieties. Let us combine our forces

and our knowledge, and build here in the glorious Northwest, where nature has been so bountiful in other gifts, a state abounding in beautiful homes surrounded by all the luxuries of forests, orchards and gardens.

After the address by the president, Mr. A. J. Phillips, of Blunt, read a paper on tree culture, which was very interesting and will be found elsewhere.

In the somewhat animated discussion that followed, in which everyone present took part, the green or blue ash, white willow, and white elm were agreed by all to be without objection for the Territory. The box elder was a general favorite. The soft maple was condemned by all for planting north of the main line of the C. & N. W. R'y. The red cedar was unanimously indorsed and the Scotch pine and Norway spruce were highly recommended. The larch was a failure.

The first business of the evening was the report of the committee on fruit list, as follows:

Apples: Wealthy, Duchess, and Tetofsky. For trial in the Missouri valley as far west as Springfield, Walbridge, Fameuse and Haas.

Crabs: Whitney No. 20, Transcendent, Hyslop and Virginia.

Raspberries, Red: Turner, Cuthbert.

Raspberries, Black: Gregg and Doolittle.

Strawberries: Crescent and Chas. Downing.

Currants: Red Dutch, White Grape, Victoria, Long Branch, and Holland.

Gooseberries: Downing, Houghton.

Cherries: Early Richmond for trial.

Plums: De Sota and Forest Garden.

Grapes: Worden, Janesville and Concord.

Mr. De Linde's list added the Red Siberian crab, native plum, Mammoth Cluster and Queen of the Market raspberry, Snyder blackberry, Wilson, Kentucky and Manchester strawberries.

FRUIT AND FOREST TREES FOR DAKOTA.

BY A. J. PHILLIPS, BLUNT, DAK.

Mr. President and Members of the Dakota Territorial Horticultural Society:

Being now located in Southern Dakota, five hundred miles from the scenes of my horticultural experiences of the past fifteen years, I confess I found some difficulty in selecting a sub-

ject for a paper, when I accepted the invitation of your secretary to be present at this meeting and read one. But, as I was anxious to meet with you, and form new acquaintances in horticulture among those who, by a longer residence here, could give us information in this, our chosen profession, that would be valuable to us in forwarding our work, I concluded to give you a few thoughts on tree planting in a general way which may draw out discussions that will be both interesting and beneficial to all concerned. Now, for me to tell you that this great Territory, extending from Minnesota on the east, to the foot hills on the west, and from the extreme northern boundary, was and is practically treeless, and needs timber and fruit trees, would be useless and a waste of time. You all realize this fact. For the purposes of this brief paper I will make only two divisions of my subject. First, planting of forest trees and evergreens, and second, planting fruit trees. These departments of tree planting are of that importance to the inhabitants of Dakota, that their value can not be estimated in dollars and cents. And the advantages, health, wealth, and comforts which result from them are of that class that cannot be enjoyed only by the planter himself or his family. But they are a benefit and a lasting good to the neighborhood, to the town, county, and state where he resides. For if it is a fact, which I fully believe it is, that the only protection there is for the Dakota farmer against the fierce blasts of the polar regions that come unobstructed so many miles through the Northwest, and which finally spread their fury in the dreaded prairie blizzard, or the warm sultry and withering winds which come from the south and southwest. that oftentimes blast the fondest hopes and destroy the prospects for a crop in a single day, is in planting forests and wind breaks. then I say the man who improves his tree claim as the law requires, or plants a border of forest trees and evergreens around his homestead, or even around ten acres on which his farm buildings are situated, not only protects his own property from disaster, ruin and waste, but to a great extent protects and enhances in value, the property of his neighbor. These winds, like the tides of the ocean, are all right and fill their mission in the laws of nature, but in both cases it is man's duty to protect himself, his family and property, from their disastrous effects. Again, if it is a fact, and I believe it is, that the planting of forests increases the rains, and causes them to fall more equally on the just and unjust, and eventually furnish fuel and lumber,

who, I ask, can estimate their value to the coming generations who will occupy this great country? It would be hard to find a man that would say he did not believe the planting and growing of trees would be a benefit to the country. But it is easy to find plenty who say they don't believe that forest and fruit trees can be grown successfully on our high prairies. These same fellows have been found following in the wave of emigration ever since the Prairie States began to be settled, and whenever they have remained long enough they have been reaping benefits from tree planting, though it was done by their more energetic and industrious neighbors. It is also easy to find men who would give the last dollar out of their pockets to send men to your capital to lobby bills through to move capitals, divide and subdivide counties, make more county seats, incorporate cities and villages, all of which means to increase officers, and as a result increase taxes on the already overburdened tax payer. Many of these left the East because there were not offices enough to go around, and they are anxious to derive means whereby they can be supported in Dakota. But, as I honestly believe, the future wealth and prosperity of the citizens of this great Territory depend largely on the planting of trees, why would it not be more suitable to raise money and send men to confer with our legislature and urge them to pass some county and state laws to encourage tree planting? Those states that have exempted a certain number of acres from taxation for the planting of trees, took a great stride in the right direction. The pioneers of Dakota, being largely Americans, mostly intelligent farmers from the East and South, it is to be expected, they will plant trees generously. They have much to encourage and guide them. Illinois and Wisconsin have been experimenting in tree planting for many years in an open country and cold climate, and have been publishing the results from time to time. Minnesota, our sister State on the east, has been following in the wake of Wisconsin in her experiments and in the diffusion of horticultural knowledge. So we too, can organize here and profit by the experience of those states, until we as a society, are well established and become able and willing to impart instruction to still newer portions of the country. I consider the outlook promising and favorable for the good work going on. I well remember in 1850, in Wisconsin, of hearing business men and farmers say, there is no use in planting apple trees here, the winters are so long and cold, and the prairies so windy that they will die before they will

produce an apple. But when I look over the statistics of that State and find that in 1880 she produced over 3,700,000 bushels of apples, I make up my mind that those men were mistaken and feel like saying something to encourage Dakota farmers to plant fruit as well as forest trees. Hardy varieties can now be obtained so that the selecting of them is not so much of an experiment as it once was. The two main points are studying the climatic changes and finding the extremes of cold in a given locality. Then finding the resisting powers of different trees to withstand that cold. These are the foundations of successful fruit and tree planting. Fruit we must have, and the apple is admitted to be the king of fruits, and to have it in any quantity, we must grow them to a great extent, or we and our families must go without this health-giving blessing. Exhibiting apples at fairs and winter meetings for the past ten years has convinced me that the farther north apples can be grown, the handsomer they will be, and in firmness and quality, cannot be excelled.

Now if the statements contained on the pages I have read are true, is it not worth an effort on our part as horticulturists to devise means to encourage tree planting? How shall we do it? My main hope is with the young. We must interest and educate the children. An ancient king once said children should be taught that which would be of most value to them when they grew to be men and women. The late Bayard Taylor said the work of the horticulturist was the beatification of nature. The most lasting pleasure of horticulture is the planting of trees. To interest the children, we must make the home attractive. We cannot expect that a desolate prairie lawn, with its many tilled acres, as devoid of beauty as the desert of Arabia, will offer any attractions for our children. They will be staying rather than living; waiting and longing for the time to come when they can desert that place and leave their aged parents by the hearth stone alone to spend the remnant of their days in solitude.

A farmer told me last fall that he could not afford to set out trees; said his crops were poor and the hail damaged them and he would be obliged to live close the coming year, but before he left town he paid out three dollars for tobacco, for three month's use, or twelve dollars a year, which expended for trees would have made his home attractive, but he preferred to throw his money away. The farmer who allows the home of his wife and children to stand desolate on the prairie instead of buying and planting some forest and fruit trees, which can be cheaply done,

is forming a blank place in their memories. Far better would it be for him to interest them, and not only plant trees himself, but show them how, and change the complexion of their surroundings. It will furnish him in timber, shade, fruit, health, comfort, and beauty. Plant trees wherever and whenever there is a chance, in city, village, country, and much more on the broad prairie, by the roadside, in our school yards and in our cemeteries—the resting place of the dead—plant them on the anniversary of the departure of some dear one, and they will prove to be living monuments to their memories, reminding us more pleasantly than marble slabs. Well do I remember the trees I loved in childhood; the old chestnut tree by the school house, where we played in those happy hours, brings many pleasant reminiscences of the past.

In the city of Blunt, Dakota, the first thing of beauty that attracted the attention of the pioneers and railroad men was the lone tree. A large cottonwood standing in the valley far away from its fellows, beautiful and majestic; inviting the birds into its branches and seeming almost to say, “I have been protected and cared for by an unseen hand to show to the settler that timber will grow here, and also to serve as a landmark and guide to the traveler in his journeyings.” What, I ask, you will perpetuate your memory better with those you love than to have them say to those around them after you have passed away and by many been forgotten, “My father planted that grove or those shade or fruit trees?” If you try to interest the boys and girls on the farm, you give them a colt, a calf, lamb, or pig to care for and have for their own. Now, I say in addition give to each a tree, both shade and fruit; leave them to care for and protect them with their own hands; it will create a desire to learn the best modes of cultivation. Much more of an accomplishment than many of the amusements of the present day. I have thought much of this plan for Dakota. Let the school districts purchase large school house sites. Hire teachers that one qualification shall be to know how to plant and care for shade trees. Then give each scholar a tree and a place to plant it. The attention bestowed on it will employ many an otherwise idle moment and create a strife as to who shall do their work best. For the small ones whose strength is not sufficient for the task, go and plant it for them and care for it until they are able to do it. If district boards should take this matter into hand, and they should be men interested and qualified for this work, what, I ask you,

gentlemen, would be the appearance of Dakota's 10,000 school houses in twenty years? And what would be the increase in the value of the same? Tenfold is a small estimate, as in that time the winter's fuel could be cut in a stone's throw of the house. Birds would come and sing and build their nests in the branches, while the little ones could play in the shade and listen to their songs. What more fitting companions could they have in their innocent days? It would make lasting impressions on their minds. Now, allow me, though I am trespassing on your time, to duplicate the foregoing for the farmer's home which should be made, as before stated, attractive and comfortable. Substitute fruit trees and evergreens for at least part of the shade trees. Give the children fruit trees to plant and care for them as their own. While they are doing it they are learning to work, and have a better chance to breathe God's pure air than any indoors employment can give. There is plenty of room in the garden, the yard, or the orchard. What, I ask, would give you greater pleasure after the weary toil of the farm than to have the children come to you in the spring time and take you by the hand and say, "Oh pa, do come and see the beautiful blossoms on my apple tree?" Or in the fall have them place the beautiful ripe fruit in your hands and say, "these grew on my tree; ain't they nice?" Ah, it would give you a thrill of delight in your tired moments that you little dream of! If this was followed up they would want to learn to bud and graft, to show fruit at the fairs and attend horticultural meetings and exhibitions; and ere long reform schools and jails would be almost useless; and saloons, those nurseries of crime in this new country, would be less patronized than they now are. Tramps, if you have any, will have to be imported. And, as I asked in the preceding case, what would be the appearance of Dakota's 100,000 farms and homes in twenty years? I leave it for you to consider and answer. The railroads of the West have done well. They, with few exceptions, have always been ready and willing to carry the horticulturists and tree planters to and from the conventions at reduced rates. They have also in many cases transported fruit and forest trees at very low rates of freight for actual settlers on the lines of their road. But they need to do more. They should furnish a hand on each section in spring and summer to plant and care for trees, and have an experienced man employed on each division to take charge of the same, selecting trees, etc. These continuous groves would be ornamental and useful; they

would soon render snow fences of less importance during our snowy winter, and not many years would elapse before they would furnish ties to repair the road. The roads west of St. Paul have taken this matter in hand and have planted many trees. The memory of the late L. B. Hodges, of St. Paul, Minn., will ever be revered for the zeal he manifested in his life-work devoted to the forest tree planting in the West and Northwest.

Before closing this essay on tree planting, will say it is a subject in which I take a deep interest and wish I was capable of giving you more information in regard to it. It calls to my mind many associations of the past. A day spent in the large orchard of A. R. Whitney, of Illinois, the originator of the Whitney No. 20 crab apple, taught me lessons I never shall forget in tree planting. In this orchard 25,000 bushels of apples have been gathered in a single year. Its eastern boundary is a row of bearing chestnut trees half a mile in length; shade trees and evergreens of all kinds abound and give the farm the appearance of a forest. In the door yards are groups of large pines, some of them over three feet in diameter; they tower high above the rest; the wind whistling through their branches sounds like the noise of a pine forest. Under these trees that tree planter eats his evening meal and visits with his family and friends. Now, for me it was hard to realize that this very spot was, less than forty years ago, a wild, naked prairie, like ours here, where the knowing ones said timber and forest trees would not grow. Then to me the thought arises, what will this country look like in thirty years if the present generation of farmers, school officers, and business men plant trees. Other associations crowd my memory. The pleasant times I have enjoyed with the veteran tree planter of Minnesota, Peter M. Gideon, who, in his ardor for planting, discovered and gave us the Wealthy apple tree. How can we of the North ever repay him; and still he pursues, though his hair is white as snow, his favorite calling, hoping by persistent planting to give us a long keeper as good as the Wealthy. Days and nights spent in company with one of Wisconsin's wheel horses in tree planting, Peffer, of Pewaukee, associate with them many interesting facts learned about the business. Time spent looking over the orchard and buildings of the late Dr. Jewell, of Lake City, Minn., bring fresh to my memory the first planting of Wealthy trees, which I obtained from him. I can only imagine what the life-work of my friend A. G. Tuttle, of Baraboo, Wis., will result in while planting his one hundred

and fifty varieties of Russian apples, when I remember his immense show of those apples at the Wisconsin State Fair, last fall. In speaking of tree planting in cemeteries, I associate with it the work of one of Wisconsin's energetic tree planters, Uncle E. Wilcox of La Crosse, who was the means of planting, and with his hands planted many of the beautiful evergreens in the cemetery at Trempeleau, Wis. At his golden wedding two years ago, I told him that the planting of those trees would perpetuate his memory when his other labors were forgotten. I could multiply these associations indefinitely, but must not trespass longer on your time, as my paper is already too long. I can only say, as to varieties, that for myself, from observations and the best information I can get, I should plant for timber box elder, green or blue ash, white willow, cottonwood and elm. For fruit or apple trees, would plant the Duchess, Wealthy, Tetofsky, McManus, White apples, Whitney No. 20, and Transcendent crabs to begin with. Evergreens I would plant, to start with, Norway spruce and Scotch pine. In conclusion I will say, if you wish your society to prosper, and your meetings to be interesting, you must persuade the ladies to attend. Their presence will encourage you, and they will give you some of the best practical papers you have. Wisconsin boasts, and well she may, of her able corps of lady writers, surpassed by no state in the Union. Foster this society. Your mission is a grand and glorious one. In the near future you will see your farms encircled with belts of timber, and the once called Great American Desert will furnish the home circle with warmth and comfort, the mechanic with material for his handiwork, the farmer with fencing and building timber, the evergreen surroundings making the now desolate and neglected farmers' homes the most attractive places in our memories. Tree planting in our cemeteries will make the resting place of the dead look beautiful, and the orchards will furnish fruit in abundance for your families and friends, and all will enjoy the satisfaction of knowing that their labors have been rewarded, and that they have accomplished a great and lasting good for themselves and their posterity.

ORCHARDING IN DAKOTA.

BY MRS. LAURA A. ALDERMAN.

Read before the Territorial Horticultural Society of Dakota.

Who shall decide when doctors disagree? Certainly no school of doctors ever disagreed as do our horticultural doctors in this new Northwest. The reason is obvious. The methods that were successful in handling fruit trees in the East proved failures here. The trees themselves were disastrous failures. Then while the many were ready to say "You can't raise apples here," there were a few heroic souls like Gideon, of Minnesota, who said he would raise apples in Minnesota or leave the State; and he would not leave the State. But the old established methods having failed us, we were at sea as to what to do next. This left the field to the theorists, and for a time they held undisputed possession. Now a cold demonstrated fact is not particularly inspiring if we have to adopt it as the result of another's research. But your theorist is always an enthusiast; his theories are his very own—his brain children, as Whittier has it—and he loves them because they are his, and his delight is to rush into print and expatiate on them. One cannot pick up a paper without being confronted, usually on the patent side, by some absurd theory or marvel of by-gone ideas and methods that passes for horticultural wisdom.

In the meantime the silent workers were developing a horticultural science for us, and not until their theories had crystallized into demonstrated facts did they give them to the world. All honor to Gideon, Sias, Patten, Harris and their co-workers who have pioneered their way to success in horticulture and pomology in the Northwest, and who saw in their most discouraging failures the germs of future success. Such men see with their brain as well as with their eyes.

In telling you, as I now propose, how to successfully raise apples here, I shall reset many of the jewels that have fallen from their lips as we have sat at the feet of these Gamaliels and learned of them, and I trust I may be allowed to say in this connection, that by following their teachings we have been singularly successful, both in the orchard and nursery, failure being the rare exception.

In selecting an orchard site look less to convenience than to adaptability. If there is a fact in horticulture that is proven beyond a doubt, it is that our orchards should be planted on northern slopes, northeastern being most desirable, southwestern least so. The reason is that the latter site will have the greatest extremes of temperature, and the former the least. In this country we sometimes have practically but two seasons—summer and winter; instance the season just past—and we find that the sun is the root of most of our pomological evils. Your orchard that is nicely protected by a dense grove just north of it, with the ground sloping to the south, giving it a warm, sheltered site, was taking delightful sun baths all through last October, and was kept in growing condition till fairly into November, followed by the coldest December that Dakota has ever known, and next spring before the ground thaws the mercury may stand for hours at summer heat in that same sheltered nook. Your trees are full of a watery sap, the leaves, that act as escape valves in summer are still in bud, and the sap cells are filled to their utmost capacity by the action of the sun's rays. At night the inevitable freezing bursts them and the mischief is done. You have killed your trees with mistaken kindness. Apropos of this subject, E. Gaylord, of Nora Springs, Iowa, writing under date of Sept. 25, 1882, in reference to the cold Christmas of 1879, and the sudden thaw which followed immediately after, thus remarks upon a kind of protection that does not protect, and another kind that does. In all our exposed and unprotected orchards the trees came out in fine condition; but in our protected sites, hemmed in by hill and timber, they barely had the breath of life left in them. The Duchess grew three inches the season following in the latter orchard, and twelve inches in the former. The sun kills more trees than all other causes. As to the soil for an orchard, avoid alluvial soils, and, if possible, select an elevated site with a clay subsoil, avoiding very sandy soil and valleys. If your land is wet and flat, plow by throwing the soil toward the tree, and drain off all surplus water. Fruit trees will not thrive in wet, sour soil. It is best to have the land in thorough cultivation before planting, but we find that by the use of a little mulch we can avoid the ill effects of the lack of previous cultivation. Now, as to the varieties to plant. If you are wise you will plant but few varieties, leaving the testing of new sorts to the nurserymen. Nature has been very kind to us in the quality of the apples that have proven successful here, the

Wealthy being unsurpassed in the number of its good points by any of the famed Eastern varieties, and the Duchess, which is acknowledged among fruit growers as our standard of hardness, being unsurpassed as a cooking apple, and withal being a very good eating apple, though not equal to the peerless Wealthy in that respect.

It is a singular fact that while Minnesota, with her one hundred and forty varieties, carried off the honors and prizes at the American pomological exhibit in 1883, the Duchess and Wealthy are the only ones that are recommended by her horticultural society for general planting throughout the State. This is because of their universal adaptability to all reasonable conditions and soils, and not because they are the only desirable sorts that she produces. But there is still another reason. Many kinds of apple trees grow weaker as they grow older, and die in the orchard just as they come into bearing; hence they cannot confidently recommend a tree until it has stood the test of many years. All fruit growers confidently believe that the Northwest has some new varieties that will not only equal but excel any that we now have. The passing years are testing them, and it will be a new illustration of the survival of the fittest. That many of them will survive we have every reason to believe, and become pomological blessings to us. But in the meantime, unless you want to try experiments, beware of new varieties of the apple sold at fancy prices. They may be very promising, but usually their promise is vastly better than their performance. Do not understand me to say that I should discard all standard apples but the two mentioned, but they should be our main dependence. There are several others, such as the Walbridge, St. Lawrence, Plumb Cider, Fameuse, etc., that we should plant in limited quantities. Of these we have planted quite largely of the Walbridge, because of its excellent keeping qualities, planting it on our most elevated ground, sloping to the north, trusting to the kindly embraces of the north wind to protect it from itself, its grave fault being its tendency to grow until late in the season.

Of the crab and hybrid apples we have a good assortment that are adapted to our wants, many of them of superior excellence. To illustrate what may be done by what has been done, I will mention that in the spring of 1878 we planted in an orchard of hybrids and crabs the Hyslop, Meader's Winter, Chickasaw Crab, Beach's Sweet, Orange Crab and Transcendent. These

have all proven perfectly hardy here, have made a good, thrifty growth, and are now in bearing. Our late plantings of the hybrids have been largely Whitney's No. 20, and this leads them all in our judgment; and not in our judgment alone, as the American Pomological Society has pronounced it the best cooking and canning apple in the United States; and allow me to predict that in the not distant future the West will lead the East in the superiority of her fruits. Within the last week Iowa has won the two hundred dollar prize at the New Orleans exhibition, offered for the best display of apples, and I have already mentioned Minnesota carrying off the national honors the previous year. These straws would indicate that the West leads even now. We must concede the East, however, a greater number of good varieties than we can boast. But they had all the advantage of the system in vogue a half century ago of planting the orchard from seed, and each tree was a distinct variety. In this way they originated their Baldwin, Spitzenberg, Bellflower, etc. Later came top grafting, to perpetuate these desirable kinds. But usually there were plenty of branches of the original tree left to bear fruit and test its worth or worthlessness. The old home orchard in Michigan, to which my memory lovingly reverts, was started fifty years ago in a corner which is still called the nursery, some gnarled and knotty specimens of the original planting still remaining; and I wish some of our advocates of close planting could see their futile efforts to reach the sunshine, and the solitary apple that sometimes hangs on some top-most branch. When the trees were large enough to transplant, the best of them were reset in the orchard thirty-two feet apart. When my people came into possession of the orchard twenty years later, every tree was a seedling—a distinct variety by itself; and even now the most of them have branches that have escaped the grafter's knife, and bear fruit from the original stock. Under this system a great variety of good sorts was inevitable; but the universal custom now prevailing of root grafting, has changed all this. We take no chances, but we get no new varieties. But our horticultural pioneers know no such word as fail, and have risen to the emergency. It is of great interest to us all to know that apples are being scientifically propagated by the pollenizing of blossoms with a view to combining the desirable qualities of the parent trees in the seedlings raised from seed so fertilized. This process, of course, involves years of more or less patient waiting, but it has already produced fruits

of the greatest promise. Mr. Gideon, who is salaried by the State of Minnesota to conduct these experiments, claims that he has, as a result of such breeding, the best apple that has been produced since Adam and Eve left the garden of Eden. Mr. Patten, of Charles City, whose opinion carries great weight with it in horticultural circles, has assured me that he also has varieties of the greatest promise similarly propagated, and others are engaged in the same work, notably Mr. Pepper, of Wisconsin; ex-president Sias, of Rochester, Minnesota. Personally I have great faith in these experiments being of the greatest value to us, as I believe in science rather than chance; but each new sort must stand the inevitable test of years to see if it proves hardy of tree, impervious to blight, etc., and in the meantime we will plant Duchess, Wealthy, No. 20, Transcendent, and such hardy old varieties, and when these later sorts are old enough to have proved their worth, we shall have the best possible trees to top graft them upon.

And now, fearing that I have concealed my ideas in the chaff of unnecessary words, allow me to pick them out for you. It is conceded by our successful orchardists that northern slopes are best for orchards, in moderately rich soil; few varieties; no unnecessary pruning—necessary to be done in late spring or early summer; no heavy wind breaks, if any protection, on south or west; no cultivation after July 1st, after which it is very beneficial to mulch to protect from summer drouth and winter freezing and thawing.

My apology for trespassing to such an extent on your time is that Dakota is being deluged by a flood of worthless trees from the South and East, accompanied by alleged instructions on how to raise them. The venders of this stock may be honest, but their business is to sell, not to raise trees. Their forte is talking, not in acting lies; and when the inevitable failure follows, the opinion will be well nigh universal that the apple is nature's forbidden fruit in this garden of Dakota, and I write this hoping to induce some modern Adam to use the same good sense in his orchard planting that he does in his other business; to first find out what he wants, then deal with some firm of known reliability to insure his getting it, then follow the teachings of those who have achieved success under similar conditions of climate and soil, and when, as the inevitable result, he sees his trees laden with luscious fruit, there will be no tinge of reproach attach to his satisfied comment—the woman tempted me and I did plant.

REPORT OF DELEGATE TO WISCONSIN MEETING, 1885.

BY J. S. HARRIS.

Hon. Truman M. Smith, President of the Minnesota State Horticultural Society:

Having received credentials from our worthy president as a delegate to represent Minnesota horticulture at the annual convention of the Wisconsin State Horticultural Society, Feb. 2 to Feb. 5, 1885, I started from home on the evening of the second, going by the Chicago & Northwestern Railroad, and arrived at Madison about midnight, making the journey from La Crescent in about six hours and by night. As it was midwinter and the ground covered with snow, the route would not have presented any very great attraction for a day ride.

Madison, the capital city of Wisconsin, has a population of about 12,000. It is in the midst of the "Four Lake Region," and is beautifully situated upon an undulating isthmus between Lakes Mendota and Monona, the two uppermost, and in situation and scenery is the most beautiful city in the State, and is peculiarly well adapted for a summer resort. It has wide, straight and regular streets, and many fine buildings. The capitol stands upon a slightly eminence in the centre of a square, well kept park of fourteen acres, wooded with native timber, is built of limestone, and from its dome commands a fine view of some of the best and most fertile farming lands in the State. In the city and vicinity are the United States court house and post-office building, the University of Wisconsin, Soldiers' Orphans' Home, and Hospital for the Insane. It is also well supplied with manufactories of various kinds, and shows an air of thrift that makes a favorable impression upon the visitor. The completion of the extensions to the capitol building, make it one of the finest state houses in the west; furnishing ample room for the legislature and State offices, rooms for the State library, Historical Society, State Agricultural Society, State Horticultural Society, and the accomodation of the annual meetings of the various other State associations; but it was found none too roomy to accommodate the people who assembled there during the session of this convention. The rooms of the State Agricultural Society contain a quite extensive library, including the

annual reports of most of the agricultural and kindred associations of America, and fine collections of grains, seeds, minerals, building rocks, and other articles of interest. In this respect the Agricultural Society is several years in advance of our Minnesota society. Agricultural conventions for the discussion of the various topics that have a bearing upon progressive farming and the publication and distribution of reports among the producing classes of our people, would give our society stability, become a great educating power, and hasten the development of the resources of the State, and it is the duty of our legislature to provide by law for the holding of such conventions and the publication of their transactions.

I repaired to the capitol at 9 A. M. on Tuesday, and found the rooms already filling up with representative men of every agricultural industry from every part of the State, all manifesting an interest that gave promise of a large and enthusiastic meeting. The leading horticulturists were on hand and busily engaged in setting out and arranging a fine collection of fruit. By actual count I found upon the tables 415 plates of apples of 73 varieties, 4 plates of pears, and 22 of grapes. The apples were, almost without exception, well grown specimens of their varieties, and showed that they had been carefully picked and skillfully handled. I have no hesitation in pronouncing the exhibition worthy of any state in the Union, and the finest one I have ever seen at the season of the year. Mr. Peter M. Gideon, of Excelsior, was present and looked over the exhibit with me, and I think will agree with what I have said of it.

The meeting was called to order at 10 A. M. by President J. M. Smith, of Green Bay, and the forenoon session was devoted principally to the discussion of the premium list for the next state fair, and the revision of the fruit and tree lists. I am led to infer that the Agricultural Society leaves the entire management of the horticultural department to the State Horticultural Society, only designating the total sum that may be offered for premiums. A resolution was adopted, requiring that hereafter all exhibits shall be placarded with the name and post office address of the owner before they can be passed upon by the awarding committee. In revising the apple list varieties were pretty thoroughly discussed. In the list of seven varieties best adapted to Wisconsin, Duchess, Wealthy, and Wolf River were retained without opposition. Pewaukee, Fameuse, Plum Cider, and Talman Sweet were also retained by a small majority vote; and the

discussion brought out that McMahon's White and Orange Winter are hardy and valuable varieties that will grow in favor as they become better known. The crab-apple list for general cultivation stands, Whitney No. 20, Gibb, Hyslop, Sweet Russet, valuable in the order named.

The strawberry list is Wilson, Crescent, Downing, and Windsor Chief for general planting, with Longfellow and Mount Vernon as fertilizers for the Crescent; Kentucky, Bidwell, Longfellow, Vick, Piper, and Manchester for trial.

The list of grapes for general cultivation stands Worden, Concord, Delaware, Brighton, Moore's Early; for unfavorable and frosty locations, Champion and Janesville.

Gregg, Miami and Doolittle for black, Cuthbert and Turner for red, were adopted as the most valuable varieties of raspberries for cultivation.

When blackberries were taken up, Messrs. Hamilton of Ripon, Tuttle of Baraboo, Hatch of Ithica, and others, gave brief accounts of their methods of management and experience with them, which demonstrated that a rich, somewhat sandy soil, is the best for them; that the Ancient Briton is the best and most profitable variety where properly managed; that as a rule winter protection is required for all varieties in Wisconsin, and that, where given winter protection and good cultivation, it is the most productive and profitable of the small fruits. The best protection is by laying down and covering with earth, straw, or corn stalks.

To lay down, begin at one end of a row, dig away a small quantity of earth, loosening it down to the roots, on one side of the hill with a garden fork—which is less liable to injure the roots than a spade—then step to the opposite side of the hill, place the foot at the crown and the fork in the top of the bush, push lightly with the fork and hard enough with the foot to bend the roots until the top is brought to the ground, and place upon it enough surface soil to hold it in place; then proceed to the next hill, using the same methods and bend in the same direction until all are down, when more soil may be thrown over them, and a covering of some other material. In the spring they are taken up by loosening the crust of soil with a four-tined fork, putting the fork under the plant and raising it up and pressing the dirt back firmly where it was taken from the roots.

The afternoon session was devoted, first to the election of officers; second, listening to the president's annual address. J.

M. Smith, of Green Bay, was elected president and Prof. Wm. Trelease, of Madison, secretary. President Smith, after a brief review of the work of the year, which showed that the society was in a flourishing condition and that its affairs had been managed with economy, gave an interesting detailed report of the Wisconsin exhibits at the World's Exposition at New Orleans. Mr. Smith had just returned from the exposition where he had been doing service as alternate commissioner and was familiar with the situation of affairs. He stated that the horticultural society had on exhibition about 1,000 plates of apples and was brought into competition with fourteen states, several of them noted as being the best apple growing states in America, and Wisconsin carried off twenty-four prizes, being a number more than was awarded to any other society. At the evening session the president's address was discussed at considerable length and many valuable points brought out in relation to packing, transporting and keeping fruits for such exhibitions. This was followed by the reports of Mr. Tuttle, Gideon, and your delegate, on the condition of horticulture in Minnesota. Mr. A. L. Hatch, of Richland County, read a paper treating on parasitic fungi and noxious insects which he showed to be more dreaded by the fruit grower than the severe cold of winter, and in very strong language condemned the practice of planting so extensively of Siberians and worthless varieties of fruit which in years of plenty would not pay for gathering and would be left upon the ground where it had fallen, to decay, breed insects and propagate fungus. He asserts that all of our trees are more or less affected in leaf, fruit, and plant by poisonous fungus, that makes its growth by absorbing the life of the plant, that the malady is increasing to an alarming extent and should be met with prompt attention by the horticultural society. This neighborhood and other parts of the State had been visited with the grape rot and mildew. He recommends raking up and burning all fallen leaves and litter as a preventive measure.

A business meeting of the society was held Wednesday evening to receive the report of the committee on articles upon exhibition, which was followed by a paper from the prince of genial horticulturists, J. S. Stickney, of Wauwatosa. He is the man who, while in the tree business, being asked for a list of varieties for profit in an orchard of one hundred trees, recommended ninety-nine Dúchess and one Duchess.

The title of the paper was, "What I Know About Orchards," in which he went back to the early times in Wisconsin, and graphically described his experience as one mixed with "joy and sorrow"—sorrow generally predominating. In his last orchard fifty to seventy-five per cent of his fruit had been destroyed by the "apple gouger." He recommends grubbing out all worthless varieties, that only serve to harbor and rear insects, and concludes with the remark that he is "uncertain about knowing anything about orchards." The discussion following the reading of the paper revealed that the troubles of the fruit growers in Wisconsin are little if any less than in Minnesota.

The remainder of the session was taken up in tributes to the memory of the late secretary of the society, Mrs. H. M. Lewis, deceased; and it was ordered that volumes containing a suitable memorial page be bound in gilt and presented to the surviving members of her family.

Another session of the society was held in the forenoon of Friday. The remainder of the time was spent in joint convention with the State Agricultural Society and the Dairymen's Association. This joint convention of the farmers, from the beginning to the end, was a grand success. The ablest men of the State were there to read papers, make addresses, and discuss the most vital questions of the hour. Thursday afternoon was mostly devoted to the reading of papers by ladies, and the countenance which the ladies give these annual conventions is very encouraging. When printed the report of this convention will be a valuable addition to farm literature, and fortunate will be those who receive a copy of it.

I have omitted to mention that Mr. Tuttle showed before the meeting freshly cut cions from a number of his Russian variety of apples, and from the leading variety in general cultivation. In none of the Russians or the Wealthy was shown marks of injury from the unprecedented cold of the present winter. All other varieties were more or less discolored.

The secretary's report was an interesting document, in which he spoke of plans for enlarging the influence of the society by laboring for the establishment of numerous local societies throughout the State. The treasurer's report showed that the entire expenditures of the year, including secretary's salary and premiums at the summer meeting, were only four hundred and thirty-one dollars. Our overtures for exchange of transactions

met with favor, and the exchange will be made should the State grant them a sufficient number for the purpose.

Our thanks are due the president and the members of the Horticultural Society for the interest they manifest in the prosperity of the Minnesota society, for kind reception and entertainment of your delegate, and their efforts to make our visit pleasant and profitable; and also to Secretary Babbitt, of the Agricultural Society, for copies of their transactions for 1884.

REPORT OF DELEGATE TO IOWA.

BY G. W. FULLER.

The Iowa State Horticultural Society met at Atlantic, in the western part of the State. There was a full attendance of the earnest, active horticulturists of the society. They greeted your delegate heartily, and voted to reciprocate our courtesy by sending a delegate to our next meeting. They hold their next session at Des Moines. The following are some of the points in their proceedings of interest to us:

1. They voted to condense everything going into their printed transactions and to put in nothing not pertinent, so as to make their book of less size. They do not deem it wise to make a large book merely as a show.

2. They declared that the hardiest catalpa was not sufficiently hardy for the northern part of their State. This being true, it is not hardy in Minnesota.

3. They voted that the Russian mulberry is valuable only for thick wind brakes and hedges, and for furnishing food for birds.

4. Especial attention is being given to the different soils as affecting different varieties of fruit. The past severe winters in Iowa have clearly developed the fact that the same varieties of fruit have stood well on certain soils but have failed on others in the same locality.

5. Another point receiving attention is the amount of starch in the twigs of apple trees as determining the hardiness of the tree. It is found that hardy trees like the Duchess of Oldenburg have a large proportion of starch in their composition, and it is thought that in this way we may determine the hardiness of a tree without giving it years of trial.

6. A good deal of attention is given to the fruits and shrubs of northeast Europe. The varieties imported by the Govern-

ment have mostly failed, but Prof. Budd feels confident that much that is valuable for us in the Northwest will be obtained from his recent importations from the steppes of Central Russia.

7. The destruction of many orchards and many varieties of apples, like the Ben Davis, by the past two severe winters, is confirmed, and these varieties are dropped from their list. Whole orchards have in some cases been destroyed.

This society is justly proud of having taken the sweepstakes premium on fruit at the New Orleans Exhibition. They hold also, three silver medals of the American Pomological Society.

THE WEALTHY APPLE.

The *Rural New Yorker* has this to say in regard to this favorite of the Minnesota horticulturist: "This fine, iron-clad fruit, which has proved such a bonanza to the fruit growers of the 'cold north,' has spread along our northern frontier and into the adjoining provinces with wonderful rapidity, so that, although it is only about fifteen years since the original tree bore its first apple, bearing trees and even orchards of it are to be found at short distances all the way from Washington Territory to the gulf of St. Lawrence. The fruit itself has as few faults as any apple grown, being of good size, fine color, regular shape, a good shipper, 'very good' to the 'best' in quality for eating out of hand, and for cooking. In season, like the Baldwin, it varies from early fall to all winter according to the locality; but in the northern part of Maine, Vermont and New Hampshire, and in Quebec and New Brunswick it will keep until March or April without serious loss. The tree is a rapid and erect grower while young, very much resembling in the habit of and early and profuse bearing the Russian apple of the type of the Duchess. If allowed to bear when young the growth is checked and the trees injured. This should be avoided by removing all or nearly all the fruit, until the tree has reached two or three inches in diameter, which is usually about five years after setting."

[The following report was read at the Annual Meeting on January 22, 1885, and should have appeared at page 207. —SEC.]

STRAWBERRIES.

BY M. CUTLER.

Fellow Members of the State Horticultural Society:

By the request of our worthy president, I will attempt to give some of my horticultural experience.

Six years since, having read glowing accounts of the great profits of small fruit culture and having seen some of the beautiful cuts and pictures of new fruits sent out by Eastern nurserymen, being disgusted with wheat-raising, I made up my mind to embark in the small fruit business. So I sold a cow and invested twenty dollars in plants, sending to A. M. Purdy, Palmyra, N. Y., and directing them to be sent by freight. Had my orders been obeyed most of them would have spoiled, but they were sent by express and I had to pay ten dollars charges, a big sum to a poor farmer just after grasshopper times. Afterwards I learned that most of the kinds I bought were for sale at about the same price near home, and most of the risk and charges saved. "Moral: Buy plants near home when possible." The plants arriving in a dry time many of them were set too deep; a heavy rain soon followed the setting, washing the dirt over and smothering many of them. What remained made a good growth of plants, and the next spring the bed was white with blossoms, when a big hail storm came, cutting them all to pieces and pounding them into the ground, and I obtained but few berries. The fruit business began to look discouraging, still I thought I would try it again. So I took good care of the plants and by fall they looked well. Snow coming in October, I did not have them covered, and as part of them were on low land they were froze out. Part of the bed being on high ground and covered with big snow banks produced a big crop, so that I had enough for home use and a few dollars' worth to sell. Hope began to revive and the next spring I decided to set out one hundred rods more, mostly to Sharpless and Crescents. I set the plants three and one-half feet apart each way, and by fall they had made a rank growth, nearly covering the ground. I mulched them nicely with hay, leaving enough on in the spring to keep the berries off the ground, and

the following summer (two years ago) they produced a crop of berries that astonished the natives. People came from far and near to see the grand sight and get a taste of the luscious fruit. Lawyers, doctors, preachers, the aged sire, decrepit widow and blushing youth went into ecstasies over the beautiful sight, and many was the resolve made to set out a good strawberry bed, which I am pleased to say has generally been carried out.

Twenty-seven hundred quarts were picked from the piece, being at the rate of one hundred and thirty-five bushels per acre; which with plants sold brought about four hundred dollars.

The past season 1,400 quarts were picked from the same piece. mostly Crescents, the Sharpless making but few new plants and producing but few berries. Had they done as well as the Crescents at least 2,000 quarts would have been produced.

I have concluded that the Sharpless is not adapted to field culture. Last spring I set out over an acre, setting several new kinds, among them Piper, Manchester, Bidwell, Glendale, Jumbo and Phelps (or Old Iron Clad). Piper made a good growth of healthy looking vines not fruited yet. Bidwell a fine healthy looking plant with large, fine looking berries. Manchester badly rusted; will not set any more at present. Old Iron Clad, a large, rank, fine growing plant with large, fine looking berries, bids fair to do well here. Glendale does well as far as tried.

There is a good demand for berries here about the time or just after they are all gone. So I have been looking for a very late berry. Last spring, seeing the Jumbo (or latest of all) highly advertised, I sent five dollars for fifty plants, started them in the house and as soon as the ground was in good condition set them in the field. My object being to get a large number of plants, I picked most of the blossoms off. The few remaining produced large, meaty, well formed, bright scarlet, pleasant tasting berries. Being started in the house they ripened early. The plants made a vigorous, healthy growth, and I think I have at least 5,000 plants. James K. Rowley, of Illinois, says that from a plant he fruited he picked two nice berries the second day of August. He thinks it will be a great acquisition to horticulturalists. A. M. Purdy says it is from eight to twelve days later than any other and very productive.

Mr. E. Crandall, one of my neighbors and a member of our society, gathered over 2,000 quarts from about an acre the past season, mostly Crescents and Sharpless.

Mrs. Larabee, a widow lady of Glencoe, picked seventy-five quarts of the same kind from a small bed in her yard.

From personal experience and observation I have come to the following conclusions:

1st. That the strawberry is a natural production of our prairie. They growing in a wild state among grass and weeds, and rapidly taking possession of land that has been broken and allowed to go back to a state of nature.

2d. That properly cared for, the best kinds of strawberries are as sure a crop as corn or wheat. That the land should be plowed in the fall, and although plants may be set up to June first, the safest and best plan is to set as early as the ground is in good condition. That they should be set two by four feet in straight rows, and kept free of weeds. That more plants are lost by not pressing the earth firmly about the crown than by any other cause.

3d. That it is useless for a lazy man, or a man that thinks raising berries and garden truck a small business, to go into fruit-raising. The result will be weeds instead of berries. That horticulturalists as a class are not friends of tobacco and whisky.

4th. That it pays to put up fruit in a neat and tasty manner, and give good measure. That to be successful, the grower should be a good salesman.

5th. That the Crescent, if properly fertilized, is the most productive and profitable berry grown on the prairies of the West. It is also the earliest, the latest and hardiest grown in this vicinity, being the first to ripen and producing berries after even the Glendales are all gone.

6th. That the greatest pleasure and reward a horticulturalist, with a family of children, receives is to see their sparkling eyes and smiling faces as they grasp the luscious fruit, and their better health by the use thereof.

In conclusion, I will say that I received the request to prepare this paper but four days ago, and in the interim a young horticulturalist has arrived in the family; which facts account for the crude and incomplete condition of this paper and my absence from your meeting.

FOSTER THE BIRDS.

BY A. W. SIAS.

Webster says foster means to feed, to nourish, to support, to bring up. And that is just what I mean when I say foster the birds. Set for them the June-berry, so as to have something

sweet and early; they are very fond of sweet fruits. The Juneberry, both standard and dwarf, can be had in this State for the digging, and are perfectly hardy. Then offer them some of the sweetest cherries you can muster, think perhaps the Osterheim would fill the *bill*. Then pick for the mildest flavored strawberries. The Turner raspberry is sweet and good and they will not refuse a share of these; set them plentifully. Next the blackberry; give them a good show of Snyder, Stone's Hardy, Ancient Briton and Wilson, Jr. Now comes the grapes, and if there is anything a bird delights in it is the Sweet Delaware grape; plant liberally of the Delaware. And so let the sweetest fruits follow in close succession from the earliest to the latest, and do not fear about getting anything too good for the birds, for that is impossible. "The laborer is worthy of his hire." We have told how to feed the feathered songsters, and now how shall we best protect them from the cold and storms? I know of nothing that will please or protect them better than an abundance of evergreen trees; shorten in all the outside branches, so as to thicken them up, and so make a perfect shelter and protection. Place bird houses and boxes about in the deciduous trees, and do all in your power to convince the birds that you are their *true* friend. It is estimated by entomologists that we have some 500,000 species of insects—a much larger number than of all other classes of animals combined. Many are microscopic, and the loss sustained by their secret workings are beyond computation. There was a move made at our last annual meeting, looking to the appointment of a State entomologist, this I most heartily approve of. But even if we succeed in this very laudable undertaking, it will not do away with the necessity we are under to foster the birds. It has been estimated by competent judges that insects destroyed over one-half the fruit crop in Minnesota the past season. This shows our subject to be one of no trivial importance.

FRUIT GROWING IN THE RED RIVER VALLEY.

The secretary, while attending the State Dairymen's Convention at Fairbault, in March, 1885, met there Mr. F. J. Schreiber, of Moorhead, Minn., and by request a brief description was given of his plans for fruit raising in the Red River Valley, which may not be without interest to fruit growers of other localities. His farm, which consists of over 2,000 acres, is

situated about three miles southeast of the city of Moorhead, in Clay County, in the very midst of the rich, level prairie lands of the famous Red River country, which produces such wonderful yields of small grain; here he has planted several thousand trees as an experiment largely, but with every promise of success. His fruit trees consist of the hardiest varieties, selected from the nursery of Underwood & Emery, of Lake City. He has a dozen rows of apple trees, a quantity of native plum and some twenty-two hundred Russian mulberry trees. He protects his orchard with rows of Scotch and Norway pine, and tamarack, set in zig-zag shape; while farther back, some one hundred and thirty-five feet, is a double row of arbor vitæ, for a hedge or windbreak; all arranged so as to form a protection upon three sides for farm buildings and yards. The trees are further protected with cornstalks and leaves of the amber cane. The trees have been set two years, and Mr. Schreiber says his success has been very satisfactory thus far. He is also interested in stock raising, has forty head of Percheron horses, and sixty head of cattle of Short-horns and Poland Norfolks of England.

DRAKE SEEDLING.

Mr. J. P. Andrews, of Faribault, gives, at our request, a brief description of an apple which he is propagating, originated in Rice County, known as the Drake apple, which promises to be of considerable value in favorable locations. This variety is supposed to be a seedling, and was raised upon the farm of a Mr. Drake, formerly residing near Northfield. The apple is of the size of the Duchess, rather tart in flavor—a good pie apple; season early winter, keeping into December; it is a nice nursery tree, and stands about the same as the Haas as to hardiness; a good bearer. Mr. Andrews is growing this with many of the leading varieties of apples and hybrids in his nursery near Faribault, where he has some 75,000 trees. He makes a specialty of the following: Wealthy, Duchess, Tetofsky, Orange, Early Strawberry, Maiden's Blush, Virginia, Beach's Sweet, Gen. Grant. Is also testing some fifty of the Russian varieties. He believes that it is desirable with fruit growers to keep pretty close to the hybrid varieties, planting very few of the standards, except in favorable locations.

FROM WRIGHT COUNTY.

Hon. Truman M. Smith:

In the St. Paul weekly *Volkszeitung* of the twenty-eighth of January, 1885, I read with much interest the reported proceedings of the Horticultural Society meetings, particularly the discussion about the culture of fruit trees. I do not think, however, that the information elicited covered ground enough, and as I have made the subject a study in Germany, and had ten years practice, I take the liberty to contribute what I believe will be useful additional information. For instance, chickens are not effective in ridding trees from caterpillars, for the reason that they cannot always get at them at the right times to prevent their doing injury. One of the best methods to get rid of these pests is, to smear a wide, thick girdle of tar around the trees about two feet above the ground, in the fall, and renew it until winter sets in. The female caterpillar, which cannot fly, in attempting to crawl up the tree to deposit her eggs on the leaves or the soft bark of the young twigs, will thus stick fast in the tar and die. The young insects which do the injury are those that hatch upon the upper branches. They at once attack the young leaves and twigs in the spring.

According to the instruction I have received, and this is confirmed by my experience, the splitting of the bark of trees is occasioned neither by the severe cold of winter or the intense heat of summer, but by early spring frosts. The first warm days start the trees growing, and the frosts of succeeding cold nights cools the bark to freezing; then comes the next day's hot sunshine, melts the frost quickly and thaws the bark. The rapid contraction and expansion act as a bruise, the bark becomes dry and preventing the circulation of sap, of course loses its vitality and is split by the force of the growing wood within.

The proper method of dealing successfully with this evil, is to cover such exposed portions of the tree in the fall, and remove such protection after there is no more danger of heavy frosts in the spring.

If one desires to save a tree that has been injured thus, the best plan is to cut away the dead bark and wood down to, but not deep enough to injure the sound wood, and cover the wound with tree wax (grafting wax). If we would grow the finest table apples, we must take great care of them in the start, and my plan is to set them in the nursery, when they are from nine

inches to a foot high, in rows from three to three feet six inches apart. The cultivation of the finest varieties of fruit is always most profitable.

I write these few lines in the interest of farmers generally, but especially for the society of which you have the honor to be president, and if you desire to have these published I shall not object. I shall even hold myself ready to answer any further questions about the cultivation of fruit trees that may be asked of me, to the extent of my ability.

I am, with high esteem, yours, etc.,

T. DILLENBURG.

St. Michaels, Wright County, Minn., Feb. 4, 1885.

Mr. Smith:

The above is a true rendition of Mr. Dillenburg's letter, and permit me to add that the cause he assigns for the splitting of the bark of thrifty growing apple trees is, I think, true, and the preventive he suggests effective. I observed an instance some years ago, of a young tree, the branches of which had been covered partially during the closing month of winter with some dry grass that fell upon it undesignedly when the trash, raked up in the yard was being thrown over the fence, close by, and was not removed till after the foliage was well grown. It alone, of three trees in the yard, was not injured in the way described. I attributed the disease to coagulation of the sap under the bark, by the sudden and severe cooling of the frost at night, and its fermenting because of rapid heating in the morning. The raising up and splitting of the bark is the consequence of the confined gas seeking a vent to escape.

I take it that Mr. Dillenburg would like to have you publish this letter in the *Volkszeitung*, of this city. Excuse my delay in performing the service of furnishing translation for you.

Yours truly,

H. H. YOUNG.

REPORT FROM B. TAYLOR.

As one of the managers of the society's experimental stations I have to report that the cherries and plums failed to grow; the late day in which they were grafted being the probable cause. I was confined to my bed with sickness when the cions were re-

ceived was the cause of delay. The two kinds of apples, Wright's Sweet and Wright's Bellefour, grew finely, being top-worked on fine stocks; but I am sorry to report them badly injured by the winter, being very nearly, if not entirely, dead.

Forestville, March 31, 1885.

CORRESPONDENCE.

F. G. Dewey, of Esmond, Dak., writes under date of Feb. 10, 1885: "We have no suggestions at present to offer that will be of interest; but will state that there is a small striped bug working on the cottonwoods in Moody and Brookings counties, and they have killed the best groves ten to twenty feet high, but did not seem to work upon other timber on tree claims."

W. F. Eastman, secretary of the Dakota Horticultural Society, writing from Huron, under date of April 1, 1885, in reference to an exchange of reports, etc., says: "There are many things common in the horticulture of Minnesota and Dakota, although our climatic conditions, especially in respect to moisture and hot, drying winds, are much different."

GERMAN AGRICULTURAL AND HORTICULTURAL SOCIETY OF RAMSEY COUNTY.

Following are the names of officers of Ramsey County German Agricultural and Horticultural Society:

President—F. W. Muller.

Vice President—Herman Christoph.

Secretary—Adam Bohland.

Financial Secretary—Ernest Venzke.

Treasurer—E. F. Lemke.

Executive Committee—Carl Bund and John Lorenz.

HENNEPIN COUNTY HORTICULTURAL SOCIETY AND
GARDENERS ASSOCIATION.

From Minneapolis Weekly Tribune, Feb. 26, 1885.

We here give place to a somewhat extended report of the discussions had at the meetings of the local Horticultural Society in Hennepin County, during the past few months. The various topics considered are timely, many valuable suggestions are given, and it seems to us desirable that the record of the proceedings, although somewhat lengthy, should be preserved in this permanent form.

DISCUSSION UPON STRAWBERRIES.

The regular weekly meeting of the Hennepin County Horticultural Society was held at the seed store of Northrup, Braslan & Co., on the afternoon of Saturday, February 21st. There was a full attendance, and much interest was manifested. These weekly meetings of the society and the attendant debate are productive of much good, and their influence is beginning to be felt among the farmers of Hennepin County.

The meeting was called to order by the president, M. Pearce. He gave notice that if there were any present desirous of becoming members they could do so by paying the usual fee of twenty-five cents. He also stated that at the next meeting copies of the State Horticultural Society's report would be ready for distribution, each member being entitled to a copy. The new report will be out early in the coming summer. Several persons paid the fee and became members.

The secretary, J. E. Northrup, then read the minutes of the last meeting, and they were approved.

The president then announced that the subject for discussion before the meeting would be "Strawberries."

William Lyons, of Richfield, read a paper, of which the following synopsis contains the more important points:

MR. LYONS' PAPER.

My method of preparing a strawberry bed is as follows: I select a good piece of land, plow in the fall and again in the spring, making it as mellow as possible. Then I mark it one way with a corn marker four feet apart. I then start a man with

a spade making holes the necessary distance apart, which is from fifteen to eighteen inches. He can make holes for four planters, each being provided with a tin pan and about fifty plants, and each straddling the row, holding the plant in the left hand on one side of the hole, as near level as possible. The fresh earth which was thrown out is now brought back firm about the plant. In this way I can nearly always have moist earth around the plant. This is not as fast as some other modes, but it gives me better results, and I have tried several methods. I use one-year-old plants, rejecting everything with black roots. Trim off old leaves and runners, and keep the plants moist. Where blossoms appear, cut off so as to let the plants get strong.

I cultivate with a horse, keeping the ground clean the first year. The second year no cultivation is given, but the weeds are cut out. I renew by planting a new patch every year, letting each one bear two crops of fruit. I have let good, thrifty patches bear a third crop, and got more money from it than I could get from any other crop. Considerable land is required and much work, but the results are generally satisfactory.

Early in winter, when the ground is frozen hard, is the time I generally cover for winter protection. There is no danger of hurting the plants at this time. The material for mulching should be all ready at this time, for it sometimes happens that a cold wind does great damage in a few days. Marsh hay and oat straw make a good mulch. Any straw free from foul seed will do. The object of mulching is to protect the plants from thawing and freezing during warm spells in winter, and if left on in summer will keep the berries clean and free from sand. I prefer level land with slope enough to drain it. Southern or eastern exposure is best, but I should never discourage the farmer from planting for his own use on a different site, for I have not yet seen a farm on which a good crop of potatoes can be grown that could not be made to grow strawberries of some variety. Different soils are adapted to different kinds of strawberries. It is desirable, therefore, that if those planted in the past have not done well, other kinds should be tried. My advice to young men going into the business would be to buy fifty plants of each leading variety, and plant them in a specimen bed. In no other way can they become posted on the merits of the different varieties. It is folly for a man to advise about varieties he has not tested on his own place.

You may ask me what varieties to plant. My own experience,

which is confined to this part of the State, is too limited to answer this question, even for my own locality. The old advice, look around before planting, and select those kinds that do best in your vicinity under similar conditions as regards soil and exposure, is the best I can give.

The following paper was then presented by Mr. C. L. Smith:

MR. SMITH'S PAPER.

As soon as the ground will do to work in the spring, plow deep and harrow thoroughly. Secure some plants of a variety that have perfect blossoms and are adapted to your soil. Have the plants taken up with all their roots and so handled as to preserve the roots fresh and cool until ready to set them, and the earlier this is done the better. I carry the plants in a pail of muddy water. Make a hole six or eight inches deep and straighten the roots down in the hole their full length. Leave the crown of the plant just even with the surface of the ground, and press the earth firmly against the root its entire length. I do not water, but there is no objection to using a little water in dry weather. It is a good plan to shade for a day or two with a bit of hay, straw, or a shingle. For the garden, plant in rows three feet apart, and eighteen to thirteen inches apart in the rows, eighteen inches for Wilson and thirty for Glendale. Don't allow a weed or spear of grass to grow, and keep the ground mellow. If there should be any blossoms the first season, pick them off. When runners start, if you wish matted rows, throw them along the row. In two weeks cut the ends of all runners. Be careful not to get your plants too thick. If to be grown in hills, cut off all runners. After the ground freezes hard enough to hold a wagon, mulch them with cornstalks, which is undoubtedly best. but marsh hay is good, as is straw. If you use hay or straw, be careful not to get it too deep, but just barely enough to cover. If sandy land, rake the mulch between the rows in the spring and leave it. If clay land, rake the mulch entirely off and cultivate thoroughly twice or three times, but be sure to mulch heavy between the rows before dry weather comes. If in hills, keep the whole surface mulched between the hills. The hills can be renewed every year or two, by allowing one or two runners to take root half way between the hills, and whenever they are well established dig out the old hill. Strawberry plants can be handled very easily and are nearly certain to live early

in the season, but as the season advances more care is required and a larger percentage is apt to die out. The earlier they are set the stronger they will be after they commence to grow. They heat very quickly if tied in bunches or packed in bunches, and cannot be sent any distance. The grain of wisdom contained in the last sentence cost me money, and I am always going to remember it. Another thing I am not going to forget is that grass kills more strawberry plants than frost and worms. It will even run out Crescent seedling if given half a chance. Look out for it and shoot it on the spot whenever it appears, for if you don't it is bound to capture the strawberry bed.

One man has succeeded in raising fine crops of Wilson's year after year by covering the ground with straw about three inches deep. Then he just parts the straw sufficient to set the plants. When the runners begin to put out he digs through the straw, covers the tips until he has the plants as thick as desired, then allows them to run on top of the straw, where they soon dry up, and the strength goes to the rooted plants. This is repeated year after year, the straw being renewed as needed and the old plants thinned out.

My conclusions from experience and observation are that the best method for field culture is the matted row system, mulching with cornstalks or marsh grass or straw. For a small garden, the hill culture or the straw method is undoubtedly the best. To produce good fruit the plants must have air, light and an abundance of moisture, the ground must be kept free from weeds or grass, and the plants must not be too thick, and the pistilate varieties must be fertilized.

The strawberry leaf roller is a formidable enemy, but one that can be conquered at a profit of about \$12 per acre. My invention is this: Early in the spring procure about six hens for each acre of strawberries, the meanest, cheapest, scrubbiest you can find; they will keep off all strawberry worms, eat up their eggs, and in fact clear the ground of all insects, and your chicken coop will pay you a handsome profit.

President Pearce then stated that he had hastily prepared a few suggestions on strawberry culture. His essay was substantially as follows:

MR. PEARCE'S PAPER.

Since the introduction of the Wilson strawberry, hundreds of varieties have made their appearance, all claiming some special

merit. If one hundred plates of the best varieties were placed before you with plenty of sugar and cream, with a good appetite and a healthy stomach, you would pronounce them all good. It is not the berries, as a general rule, possessing the best qualities that meet a ready sale. Freshness, size, color and form are what sell berries. Every market grower should become acquainted with all the best varieties, and then select the hardiest, most prolific, high colored, and those of good form and large. In making selections, due attention must be paid to the distance you are from the market. If near market and the fruit can be sold at once, or in a few hours, soft varieties can be selected. But if at a distance from market, varieties of a firmer texture must be selected. Every grower should select both pistillate and hermaphrodite varieties. If this be done with care and knowledge, color, form, size, and firmness can be improved. For sandy, loose soil, near market, the Crescent seedling and Downer's Prolific would be good selections. The size, color and form of the fruit of both varieties are good and the crop would improve the fruit on the Crescent. For heavy soil, Wilson, Glendale and Seth Boyden hermaphrodite, Crescent seedling, Windsor Chief, and Manchester pistillates.

The fruit of all these varieties is large and firm and color good. I would arrange on the ground as follows: Setting from a foot to fifteen inches one way, and thirty-two inches the other. I would plant two-thirds of my ground to Wilson, Glendale and Crescent seedling, in the following order: First row, Crescent seedling, next row Wilson, next two rows, Crescent seedling, next row, Glendale, and so on, till two-thirds of the ground is planted, closing with one row of Crescent; then one row Windsor Chief, then a row of Glendale, then two rows Windsor Chief, and so on, till one-half the remaining third is planted, stopping with one row of Windsor Chief; then one row of Manchester, then a row of Seth Boyden, then two rows of Manchester, and so on till the remaining half third is planted. The last two varieties will make fancy berries.

Level ground, as far as possible, should be selected for a strawberry bed, not subject to wash or overflow. The plants, the first year they are set out, should be thoroughly cultivated with a light cultivator and kept clear. As soon as the plants begin to vine, run the cultivator but one way and carry the runner lengthwise on the rows and let them form thick, matted rows, and keep, by the use of the cultivator, an open space of a foot or fif-

teen inches between each row. If the soil is light and sandy, mulch late in the fall; if heavy, mulch in the winter on top of the snow, about one and one-half inches deep, with straw or marsh hay. Let it remain till late in the spring, and then rake the most of it between the rows, and let it remain there. The second year it does not pay to cultivate. Pull out the weeds, and after the berry season is over, plow up the bed, and set a new bed every other year. All strawberries require good soil. For the Wilson it should be very rich, and in all cases water will do wonders in production. Strawberries are very easily grown, but require good judgment in selecting the location and preparing the soil. They can be made very profitable. Three hundred bushels per acre we would not consider an unusually large crop. The record of the Crescent is four hundred and sixty bushels per acre. The profit in growing strawberries is not to spread over too much ground. Get from one acre what is usually got from five, and better fruit, and much less expense of picking.

GENERAL DISCUSSION.

At the conclusion of Mr. Pearce's paper, a general discussion of the subject of strawberries was entered into.

Mr Lyons said: I have raised the Countess and Downer's Prolific. They look very much alike, but are two different strawberries. Some people say they are the same. The Countess blighted with me two years in the last fifteen. I had Downer's Prolific in the same field, and there was no blight with them at all.

Mr. Isaac Gilpatrick. I have always planted in hills. I would not plant any other way. Last year I had one-tenth of an acre, very badly taken care of, and got forty to sixty quarts a day. I got everything too close together, and the consequence was that I didn't get a good crop. I claim that I could take the same ground and get eighty quarts a day. I picked twenty-six days. My ground was well prepared sandy loam, gravel subsoil, well mulched with straw manure, and every runner taken off. I raised berries for my own use, and therefore didn't take care of them as I otherwise would, but I can take the same ground now and get good returns from it. I never raised anything but the Wilson until last year. I set them all too close, and lost nearly one-half by it.

Mr. Pearce. What can be grown per acre by your system?

Mr. Gilpatrick. I should not think it a very large crop to raise four hundred bushels. I should not expect to get less than that. I had a patch last year that averaged more than six hundred bushels per acre. The president of the State society said that it was the best piece of ground he ever saw in strawberries. I think you are all mistaken about what it costs to keep strawberries in the hill. And that's not all. If you keep strawberries in the hill you can have a crop every year. As soon as the crop is ripe you can have a crop started between, and they will bear a good crop the next year. The old plants can be pulled out. I raised berries on the same ground ten successive years, and then lost a crop by grubworms. My experience would teach me to plant eighteen inches between the hills and two and one-half feet between the rows. Prepare the ground just as for corn. I wish to say that my experience is very limited except with the Wilson. If you have the strawberries mulched you won't hear about their drying up. Put only one plant in a hill; if more than one are planted in a hill, they will injure each other. Raising Wilsons in the hill is new to me. Mulch with anything, straw manure, or even with shingle shavings. I should prefer straw manure. This don't apply to wet land, only to sandy loam. I mulch as soon as I set out the plants. Set the plants early in the spring—in April.

In answer to the question whether the runners will take root from the mulch, Mr. Gilpatrick said they would not if it was good straw.

On being asked what kind of berries he would recommend as best for keeping late in the season, Mr. Gilpatrick said the James Vick was the best he had. They lasted about three days after they were ripe. The Glendale is very good for that also.

Mr. Pearce inquired if Mr. Gilpatrick did not think that where persons were raising small quantities it would be a good plan to use potted plants. Mr. Gilpatrick said he thought so. Mr. Pearce said he had seen Mr. Gilpatrick's strawberries, and he was positive that nothing like them had been produced in the State.

Mr. Gilpatrick said strawberries are not half as liable to winter-kill if well mulched: He never lost plants that were mulched.

A member said that he did not think it necessary to have potted plants at all when they are set out late in the season.

Mr. Pearce. There is just this in potted plants: As soon as the plants begin to run in the spring you can set the potted

plants. I have been using potted plants myself. By that means I can get them out very early, and when fall comes I have got great big plants.

Mr. Gilpatrick said that if they were put out early a large crop could be had the next year.

Mr. Pearce. I think there is a great advantage in potted plants. They are stronger; and the best berries in this market have been from potted plants. After you get started it is an easy matter. I just put the pot down. Eastern growers are almost universally using potted plants. One-and-a-half-inch pots are large enough. I think I can pot 1,000 plants in two hours. Hereafter I shall use pots altogether. Of course where you are setting out acres it is a different thing.

Mr. Smith. Should plants be cultivated in the spring?

Mr. Gilpatrick. Not in sandy soil, but in clay soil it is necessary. On sandy soil just level the mulch, and do not stir the soil. Be careful about mulching too early. I have known my neighbors to lose a crop once in two years by mulching too early.

Mr. Pearce said the best crop he ever grew he mulched in the winter when the snow was a foot and a half deep. He put the straw on just before Christmas. He said that his experience was that the cold spring weather was what kills the strawberry plant. He said that people were punching him up for plants at a time when he had to tell they were covered with snow. Strawberry plants can be kept in that way almost always through this freezing and thawing.

Mr. Gilpatrick said that if the winter is open the plants should be covered.

Mr. Smith said that if they had not been covered up with snow by December 10th, then they must be covered up with something else.

Mr. Pearce said they must be covered lightly. An inch of straw is enough. The trouble begins when the snow goes off.

In answer to a question as to how straw and horse manure would do for a covering on heavy land Mr. Gilpatrick said it would do for a covering, but would not do for mulching.

A remark was made to the effect that if manure was used for mulching there would be plenty of leaves but no fruit.

Mr. Pearce said that we should breed strawberries in the same manner in which we breed animals. We should reject everything that is bad. In selecting old varieties try to get nice colored berries and cross them. By crossing you can get better

berries. We can have handsome berries, and raise berries just as we please, by crossing the different varieties. If a strawberry has a good form it will sell. It is the form and color that fascinate.

Mr. Smith. My experience with the Seth Boyden was that they ought to be good, for the berries were very scarce on the vines. I gave a man two dollars for one hundred Seth Boyden plants, and put them out in hills three feet apart. I was going to have something nice. I got from three to five berries from each hill that were half as large as hens' eggs, but they cost me from three to five dollars a quart; and only one got ripe at the same time. From these vines I would not get over three quarts in any one day. But they were very nice; and for the last few I got thirty cents a quart. I would not advise anyone to plant the Seth Boyden.

Mr. Lyons said the Seth Boyden did nothing for him. The berries were few and far between.

Mr. Pearce thought the Seth Boyden was adapted to certain kinds of soil, and that there were localities where they would do well.

In answer to the question as to how far plants could be fertilized, Mr. Pearce said that when the fertilizing varieties were in blossom, and the weather was favorable, the air became impregnated, and it spreads and will go hundreds of feet. Plants must be fertilized or they won't amount to anything.

The subject of mulching being introduced, Mr. Lyons said: I mulch for field culture. I generally put it on just about the time the ground is froze; but there have been times when I did not get around to it soon enough in a very dry winter when there was a very hard frost lasting for three or four days.

I mulch the first year in my mode of cultivation. The second year I don't generally mulch at all. The plants take care of themselves.

A member asked whether or not it would help the plants to manure with fine manure in the fall.

Mr. Lyons. I got, in the fall of the year, some fine manure and covered the patch. The next season was dry, and I had a splendid crop of berries. The next season I served five acres the same way, but got all vines and not much fruit.

Mr. Smith had the same experience. He thought it was not safe to manure.

Mr. Gilpatrick said a good covering was to put on corn just

as it grew, the heavier the better. One thickness was sufficient. It will take ten or twelve tons to the acre to cover properly. It will not take half as much fine fodder.

VARIETIES RECOMMENDED.

Mr. Lyons recommended, for sandy soil, the Countess or Downer's Prolific and the Crescent seedling, planting one-third Countess and two-thirds Crescent. That is, one row of Countess and two rows of Crescent. The recommendation was adopted.

Mr. Pearce said there was some doubt as to whether or not the Countess was identical with Downer's Prolific. Downer's Prolific is probably the Countess modified.

Mr. Smith recommended, for general cultivation in heavy soil, the Wilson or Glendale and Crescent seedling, planting one-third hermaphrodites and two-thirds Crescents; that is, one-third Wilson or Glendale and two-thirds Crescents. In other words, we plant the Wilson and Glendale for fertilizers. The recommendation was adopted.

Mr. Smith recommended for trial on all soils the old Ironclad and James Vick for general cultivation, and the recommendation was adopted.

Mr. Perace urged a more extensive cultivation of the strawberry. He said that over half the berries consumed were raised in other sections of the country.

Considerable discussion followed regarding the merits of the Manchester, Minnetonka Chief, Jersey Queen, Iowa Prolific, and some other varieties.

The subject for discussion at the meeting next Saturday was then agreed to be "Raspberries."

MEETING OF FEBRUARY 28, 1885.

Minneapolis Tribune, March 5th.

THE RASPBERRY AND ITS CULTIVATION.

The regular weekly meeting of the Hennepin County Horticultural Society was held at the seed store of Northrup, Braslan & Co. on Saturday afternoon, February 28th. There was a larger attendance than at the last meeting, and the discussion was spirited, and much valuable information in regard to the cultivation of the raspberry was elicited.

The meeting was called to order by the president, and the minutes of the previous meeting read by the secretary. Mr. Pearce said that he had recommended one and one-half inch pots for strawberries, but wished the minutes to be changed so as to read two-inch pots, that being a more suitable size.

MR. PEARCE'S PAPER.

President Pearce then read a short paper, the main points of which were as follows:

In growing raspberries for home use and the market it is very essential that we should be well acquainted with each variety. They should be early, medium, and late, hardy, prolific fruit, large, and of good color and quality. He would not recommend the dropping a good hardy market variety, such as the Philadelphia, Mammoth Cluster, and other varieties, on account of the fruit being second class. More than two-thirds of the people who buy fruit select that which is the best looking regardless of quality, but not so with all. Some have a cultivated taste and always buy certain varieties of berries if they are in the market. Consumers of berries, as a rule, like a change, and it is well for growers to have them. It is the early berry that brings the high price. The first that come to the market sell for from twenty-five to thirty-five cents per quart, and those that come ten or twelve days later from fifteen to twenty cents per quart. Mulching, to some extent, will increase the size of the fruit, but will make them ten or twelve days later than the same varieties that are frequently cultivated and not mulched.

I know of no variety that is adapted to this climate that is as early as the Turner. The fruit is of good size and a bright scarlet color, firm, and of excellent quality. The Philadelphia is an old variety, hardy and very prolific, and if not frequently cultivated or mulched the fruit will be small and imperfect after the first or second picking. The fruit is soft, of a dull brown color, and second or third in quality, but is grown in large quantities, owing to its great productiveness. It ripens from a week to ten days later than the Turner.

The Cuthbert is growing rapidly in favor. The plants for a number of years have proved very hardy, prolific, and sometimes long in bearing. The fruit is very large, of good quality, firm and fascinating in color. They begin to ripen a few days later than the Philadelphia, and sell readily.

Among the black raspberries the Doolittle is the earliest, and as hardy as any known variety.

The Mammoth Cluster in hardiness ranks second, with large fruit and of fair quality.

The Gregg is the largest and latest of all the blackcaps. The fruit, owing to its large size and great beauty, is very attractive. Owing to its late growth it is very apt to kill down from a third to a half unless planted in a favorable location. It is advisable to grow a few plants of this variety.

In growing raspberries for profit, aside from cultivating and mulching, due attention must be given to thinning out, pinching back, and cutting off in the spring all diseased stocks or wood. When the new plants of the red raspberry attain a height of four and a half or five feet the leaders should be pinched back. This will stop the upward growth and make the plants stocky. In the spring when the new plants start all should be destroyed except two or three in the hill, and they should be a little apart. In the spring all injured or dead wood must be cut away without fail. If not the fruit will be small and poor.

There is no profit in growing small berries for market; the extra cost of picking and the reduced price of selling will take all the profit. For that reason we recommend planting them a little further apart than is usually done. This gives the plants an abundance of air and sunshine, which makes the fruit larger, firmer, and of better color, and the yield per acre is equally good, if not better, than when they are closer. There are several varieties that I have not spoken of that it would be well for the society to recommend for trial. The soil for raspberries should be dry and moderately rich.

The president said that he had only covered a few of the most prominent points of raspberry culture, merely an outline. He had laid a foundation, as it were, and the subject was now open for discussion.

GENERAL DISCUSSION.

The question being asked how far apart plants should be set and how many canes should be left in a hill, Mr. Chandler said that his method was to put the plants four feet apart and six feet between the rows. He only left four or five canes in a hill, not very often more than that.

Mr. Pearce. I would say that it is best to put them a good

distance apart. I would put them five feet one way and six feet the other, thus giving plenty of room for cultivation. My experience has been that I can do just about as much by cultivation as by mulching, and in cultivating I produce berries a good deal earlier. If they are mulched they will be much later. A great many people mulch their berries, and the result is that the late varieties are ripe at about the same time as blueberries and blackberries. As a general rule I don't think there is anything gained in mulching, although you may get larger and finer berries. But that is a question that we differ on. I cultivate from the time they commence to grow. Just as soon as vegetation starts, when the buds begin to swell and the new shoots to start up, cultivation should be commenced. The shoots must be destroyed as soon as possible, for they take from the bearing power of the plants. Destroy them and throw the whole strength into the plants. I think it better to destroy all plants except those that you want for fruiting next year. Select two or three of the best plants and let everything else go. After they begin to bear I would go through them with a cultivator and cultivate them all the time. As good a grower as I know follows that plan. Cultivation is better than mulching, for mulching holds them back. They have got to have moisture, and if they are close together they don't get it, but they will if placed further apart.

Mr. Dean. I have not had much experience in cultivating raspberries, but have a plan marked out that I thought of following. I want to get some light on the subject. I have a patch of about two acres, and last summer I mulched them very heavily with old hay, cornstalks, straw, and anything I could find. I didn't allow anything to grow except the new shoots. After berrying I took a plow and plowed against the row on each side. This spring I intend to cultivate two or three times with a shovel-plow. I would like to ask if anyone has had any experience that way. My soil is quite sandy.

Mr. Pearce. I think Mr. Dean is right. I think raspberries should be cultivated in the spring, plowing deep and leveling the ground as soon as possible. If you are after early berries, continue the cultivation without mulching.

Mr. Gilpatrick. I think his plan is a good one. I would prefer his plan to anything I have heard.

In answer to the question whether or not there was any danger of getting the land too rich, Mr. Dean said there was no danger if too many sprouts were not allowed to grow.

Mr. Chandler. I do not mulch my berries until a week before picking them, and then mulch them heavily.

The president asked Mr Chandler to state what he did in regard to thinning the plant out.

Mr. Chandler. I set my raspberries just as early in the spring as the ground can be worked. As soon as they are set out, I go into them with a cultivator, and keep cultivating them right along. When they get about two feet high, I pinch them back, and let them branch out two and a half feet. I leave about four stalks in a hill. As for suckers, go around them with a sharp hoe. Don't let them grow at all. I have the Philadelphia and Turner. The Philadelphia bore the most fruit, but the Turner gave the largest size. The difference in the price of these two varieties was from two to five cents.

The question being raised as to which was the best berry to raise, Mr. Pearce said that his experience was that there was more profit in the red than in the black. He believed that every market grower should raise both kinds, for the reason that if only one kind is raised customers are likely to ask for the other and not be able to get it. People get tired of one kind and want a change.

The question was asked what is the best blackcap to raise. Mr. Chandler didn't know. Mr. Busse and Mr. Lyons never raised them.

Mr. Gray. I have raised them, but don't intend to any more. I had the Doolittle and Mammoth Cluster, I fruited them four years, pulled them up and raised a crop of turnips, and got more for the crop of turnips than for the raspberries.

Mr. Pearce. I think, if you will take the Gregg raspberry and cultivate them, and keep them in rows, and dig the dirt out from the roots, and bend them over till the stalks reach the ground, and cover with dirt, you will raise just as nice black raspberries as you ever saw, and plenty of them. A gentleman at Long Lake raises an immense quantity of them and gets the highest price in the market.

Mr. Roberts. I have raised the Doolittle a number of years, and had good crops. Some years I would cover them up and some years I would not. Once in a while, when I did not cover them, they would kill back. When I covered them up I had immense crops. Never raised any but the Doolittle.

Mr. Lyons. I had an extraordinary crop by covering up. The Gregg raspberry is splendid if you cover it up, but if not it is not good.

Mr. Chandler, recommending high lands for raspberries. The higher the better. I should prefer a north slope.

Mr. Pearce. There is another question I would like to hear discussed, and that is what protection we can give raspberries. Is there any protection we can give for covering to assist them in ripening?

Mr. Gray. If land is in good shape for raspberries, it should stand for four seasons, and then the plantation should be changed. If the land is good for anything, you can have four good crops, and then it is time to change about and make a new plantation. They don't do as well after four seasons as before.

A member said he had raised berries in the same place for ten years, and they were as good as ever.

Mr. Pearce. I think it best to mulch only with the leaves that drop from the bushes. That is enough. It will get richer. In regard to beds running out in three years, I know of two that have been planted fourteen years, and last year was produced the heaviest crop ever raised. The secret of the whole thing was in trimming, plowing, cutting out the sprouts, and not getting the stalks too thick.

Mr. Dean. What is the cause of winter-killing? I have an idea that where water will lie they will winter-kill. It is different where they remain dry in the spring.

Mr. Pearce. Low, frosty ground should be avoided. By all means select the highest ground.

Mr. Dean. Don't you think they will winter-kill some other way than from frost?

Mr. Pearce. As a general rule I do not think surface water will hurt plants. Wet land will kill plants. I think there is more injury done to raspberries in the spring than at any other time, that is if they winter well.

The question was asked, how should raspberry bushes be treated when they are through bearing?

Mr. Gilpatrick. I take out all bearing stock just as soon as it is done bearing. I find that taking the old wood out hardens them up for winter. They get hardy and ready for winter. When the bushes get high enough I clip them off and bury the tops when winter comes. I had considerable trouble with raspberry bushes before I commenced to bury them.

Mr. Pearce. I had a little experience with the Turner. I neglected them one year and got them too thick. The new shoots got ahead of the fruit. I went to work and cut them down be-

low the fruit, and every last one of them died. There should no cutting, you should pinch them back.

Mr. Gilpatrick had received information from an Eastern grower, who is one of the most successful growers in the country, that he sets the plants seven feet between the rows and five feet between the hills. The first year he lets them run to twenty inches and the next to thirty inches. He only leaves one bearing plant in each hill.

VARIETIES RECOMMENDED.

The question of the best red varieties for cultivation was then discussed. Mr. Chandler favored the Turner. Mr. Gilpatrick said the Turner was his choice every time. Mr. Lyons said there was nothing better.

It was moved that the Turner be recommended for early cultivation, and the motion was adopted.

Mr. Busse recommended the Philadelphia for second best for early cultivation. The recommendation was adopted.

Mr. Chandler recommended the Cuthbert for trial.

For the best black varieties Mr. Roberts recommended the Doolittle for early cultivation.

Mr. Gilpatrick recommended the Gregg for general cultivation, but it must be covered up in the fall.

The question of the different fruit boxes was then discussed very freely, but no conclusion was reached.

CURRANTS AND GOOSEBERRIES.

The question to be discussed at the next meeting was agreed to be "Currants and Gooseberries." Mr. Gray was requested to prepare a paper on the subject. The meeting then adjourned to Saturday, March 7th, at 2 o'clock P. M.

MEETING OF MARCH 7, 1885.

Minneapolis Tribune, March 12th.

CURRANTS AND GOOSEBERRIES.

Paper by J. S. Gray—The Best Varieties—The Subject Thoroughly Discussed by the Members.

The regular weekly meeting of the Hennepin County Horticultural Society was held on Saturday afternoon, March 7th. The minutes of the previous meeting were read and, after some slight correction, were approved. Mr. Pearce desired to make a correction in his statement concerning the treatment he intended giving his raspberries. He said he intended to cultivate them two or three times in the spring, and afterward mulch them. The president then announced the subject for discussion to be "Currants and Gooseberries."

Mr. J. S. Gray read an able and exhaustive paper on the cultivation of the currant, which is herewith reproduced in full:

MR. GRAY'S ESSAY.

We believe that the currants which we cultivate are from that stock which are natives of Northern Europe, the red and white kinds which were known three hundred years ago as smooth-stemmed gooseberries, the black ones being called squirraney berries. Fuller says that the name currants, or corrans, was given them because of their resemblance to the Zante grapes, which are called corinths in the English market, as it was formerly almost entirely imported from that market. And while three hundred years ago the scattered inhabitants of Northern Europe must needs take to the woods and pick the wild, smooth-stemmed gooseberry, or go without, we of to-day find it difficult, with our fruit gardens, and all the helps of scientific agriculture, to produce enough of this fruit to meet the ever-increasing demand.

There are many different methods of propagation, namely, from seeds, green cuttings, ripe wood cuttings, layers, branches split from the main stem and dividing. Not wishing to discourage any new beginner by making a simple business process too formidable, I will describe only the usual and most successful

method of propagation, which is by ripe wood cutting. In the fall, after the bushes have shed their leaves, make your cuttings from the new wood; cut the pieces to six or eight inches long, square on the butts, slant on the top; tie in bunches and plant as soon as the ground can be got ready. It must not be understood as being absolutely necessary to plant cuttings in the fall, but we find that the most desirable results are attained by this plan. If the planting is to be delayed till spring the cuttings must be made in the fall and buried until ground can be worked in spring and planting done as early as possible.

If a large lot is to be planted, ground should be well plowed and harrowed, and straight furrows drawn three feet apart. The cuttings are then placed on the land side of the furrow, the soil well packed down around the butts of the cuttings, and the rest may be loosely worked in, remembering to so place the cuttings that two eyes, or buds, are left above ground; now a covering of straw or coarse manure, and the job is done till spring. By this system of fall planting the cuttings will all be callous and some make roots before winter, and when spring comes they are in the best possible condition to make good roots, which they will commence to do as soon as the ground thaws out. I will here say that in preparing the cuttings the buds are all left on, as it is more generally conceded that it is best to grow the currant in the stool form, and the buds being all left on will produce in after years a good supply of suckers to take the place of the old wood and those stems destroyed by borers.

If anyone wishes to grow the currant in tree form, in preparing the cuttings cut off all the buds except the two uppermost, and allow only one of these to grow, and then cut and shape the bush to your own liking. Fine, large fruit can be grown by this system, but if the borer gets into your one-stem bush that whole bush is doomed, and an ugly gap made in the row. Returning to our bed of straw-covered plants. When spring has advanced three or four weeks, we rake the straw from each alternate row, and run through with cultivator, rake the straw from the other rows, and cultivate the whole patch, leaving the straw on the ground all summer. The cultivating may be repeated whenever necessary. By this process of propagation fine plants are grown, with a loss of perhaps five per cent.

We should have for the main bed a good loam soil, rich, deeply plowed, and well harrowed. If the land is so full of manure that a furrow cannot be plowed, then mark with a six-foot marker.

Now walk from one end of the row to the other, stepping three feet, and plant with a spade at each footmark. If the land is not manured broadcast, then plow out the furrows deep, and manure in furrow before planting. At this distance 2,400 plants will be required for an acre.

For the first year a row of cabbage, dwarf peas, or beans may be grown between the rows. The after culture will be the supplying of large quantities of manure, mulching around the bushes, cutting out wood that is too old, and that destroyed by borers, but always keeping four or five stems to each plant, keeping the ground mellow by horse work, and such weeds and grass that spring up close to the bushes pulled by hand.

The varieties which have given the best general satisfaction are the Red Dutch, White Grape and Black Naples. Probably one or two other varieties of English origin, and also one or two of the seedlings of our local growers, may be better than those above named, but they should have a more extended trial before being recommended for general cultivation.

The currant worm is the larva of a yellow, partly brown-winged moth, which lays its eggs on the leaves of the currant. These worms are very destructive to the foliage of the bushes, and will in a few days, if not attended to, rob them of their entire foliage. The remedy is powdered white hellebore dusted on. A weak solution of Paris green will kill them very quickly, but it is too dangerous to use on fruiting bushes.

The borer is a common enemy to all plantations of currants. The stems containing a borer can generally be told by being of a darker color and having a withered look. The remedy is to cut out all such wood and burn it.

Assuming an average crop of fruit to be two pounds to the bush, with 2,400 bushes to the acre, we have:

Value of 4,800 pounds, at $7\frac{1}{2}$ cents.....	\$360
Cost of picking, at 2 cents per pound.....	\$96
Baskets, twenty dozen, at \$1.....	20—\$116
	<hr/> \$244

Leaving us \$244 per acre for cost of plants, manure, culture, mulching, pruning, and marketing. Not having the necessary data at hand for making a reliable statement as to the cost of the above items, I will leave it open.

In closing, I wish to call your attention to the fact that although

the mode of propagating by cuttings, as described in this paper, cannot be excelled for producing good, strong, well-rooted plants, still we cannot expect to make any advance in size of fruit, quality, size of bunches, hardness of wood, or any constitutional change whatever. In fact we are at the end of our string, and must needs resort for advancement to the proceeds of growing seedlings from our best varieties. And I am of the opinion that we should call on the agricultural department of our State University to undertake this work, as the raising of seedlings requires a care and attention which few gardeners feel inclined to give, when it is remembered that long years of work and waiting must elapse before a test can be had of the value of the plant, with, perhaps, after all, nothing obtained of a money value, but simply a start in the right direction.

The thanks of the association were voted to Mr. Gray for his very clear, interesting and instructive essay.

DISCUSSION OF THE CURRANT.

The president then announced that the subject was open for discussion. He said that Mr. Chase had raised a great many currants, and asked him to give an estimate on what he considered a good crop.

Mr. Chase said that Mr. Gray's estimate was not far out of the way, but his opinion was that it was a pretty good crop.

Mr. Busse said he had raised more than that on three-year-old bushes.

Mr. Gilpatrick said his experience had been about the same as Mr. Gray's. He had had better crops than that, but that was about a fair average. The borers and blight on leaves set them back.

Mr. Pearce wanted more light on the questions of location and the preparation of the soil.

It was suggested that the richer the soil was the better it was.

Mr. Gilpatrick said his land was sandy loam, and he cultivated every two weeks.

Mr. Pearce said that on heavy land he would only cultivate in the spring.

Mr. Gilpatrick. It seems to be the opinion of four or five of my neighbors that that is the right plan. Those who have sandy land cultivate a good deal, and those that have clay loam cultivate less. I mulch with straw manure.

The subject of mildew being introduced, one member said he never remembered having mildew on his currants. Another member said his mildewed very badly last year.

Mr. Gilpatrick spoke of a case where whale oil soap had been used very successfully on mildewed bushes.

MULCHING AND CULTIVATION.

Mr. Pearce asked whether or not it was not best to mulch currants before cultivating in the spring. Mr. Gilpatrick said that whenever he had tried mulching the currants had done well. It was asked if corn fodder was not good for mulching after cultivating, in place of straw and manure. Mr. Hooper said his experience with corn was very discouraging. Mr. Chalmers said he was going to mulch his about a foot deep, after he had cultivated them once or twice, with straw and marsh hay.

Mr. Busse said that on clay subsoil he had found that the best thing to do was to thoroughly cultivate in the spring, taking a spade and digging around the bushes, and then to take rubbish or manure and mulch. After the fruit is picked give another cultivation. If there are any weeds pull them up. A spade is a good thing to use in cultivating around bushes.

Mr. Dean said there were two objections to mulching. One was that the roots grew too near the top of the ground and dried out in the hot weather. Another is that insects are more liable to breed in the straw than they would be if the land was thoroughly cultivated. He didn't think that land could be made too rich for currants.

Mr. Pearce. I think that it is the nature of plants to feed from the surface. I know of no plant that draws its nourishment from the surface so much as the currant. I took a patch once and covered it thick with straw, and the bushes grew more rapidly; the currants were larger than where cultivated. I examined the roots under the straw, and found that there were thousands and thousands of little roots there that came right up to feed. The currant is a surface feeder; and nearly all trees are more or less that way.

WORMS AND BORERS.

Mr. Pearce said the leaves indicated when borers were present. The wood turns black. He had cut hundreds of little

branches off, and found that the pith was entirely eaten out, and the worm was still alive.

Mr. Gray. I asked one of my boys what was the difference between the American borer and the European borer. He said that one was the son of a moth, and the other was the son of a beetle. One of them has feet, and the other has no feet. The beetle and the moth go out in the spring and lay their eggs. The eggs hatch out, and the worm eats the pith out of the stem, and the plant is destroyed. It remains, then, in the pupa state until spring, when it passes out.

Mr. Gilpatrick had raised currants for twenty-four years and lost but three crops. He cut the little bushes close to the ground every spring, and put on wood ashes, and has had no trouble since. He thinks the lye from the ashes kills the worms. He told a neighbor, who tried the same thing, and the effect was the same.

Mr. Busse. Take a handful of salt to each bush, and you will be sure not to have any borers near.

Mr. Roberts. Two years ago I put on a lot of coal ashes, and think I had the biggest crop I ever had before. I took the ashes from the stove in the winter, and threw them around the bushes. In the spring I took my hoe and worked them into the ground.

Mr. Pearce said that the borer was the greatest thing we had to contend with. More currant bushes had been destroyed by them than in any other manner, and if salt would kill them it was important that it should be known.

Mr. Gray thought the salt should be applied about the first of June.

VARIETIES RECOMMENDED.

On motion of Mr. Roberts the Red Dutch was recommended for general cultivation.

On motion of Mr. Gilpatrick the Stewart seedling was recommended for trial.

Mr. Gray recommended the White Grape for general cultivation, and it was agreed to.

No conclusion was reached in regard to black currants. Mr. Pearce said that it was a mistake that more of them were not raised. They are recommended by physicians, and will sell readily.

GOOSEBERRIES.

Mr. Gray said the only hope for us was in seedlings. The English gooseberry will mildew.

Mr. Gilpatrick had made a good many experiments with English berries, but had had no success.

Mr. Gray believed there was no use bothering with plants that are not adapted to this climate.

Mr. Pearce thought that the Downing was the most profitable berry.

Mr. Gilpatrick would not advise anyone to set out anything but seedlings.

Mr. Hodsdon, twenty-five years ago, planted wild gooseberries in his garden, and they improved in color and size, and grew more abundantly.

Mr. Pearce said that Mr. Sias, of Rochester, has been experimenting a good deal with gooseberries, and had become quite interested in it. He had grown a great many seedlings, and thought he had some profitable ones now. Mr. Pearce was of the opinion that the gooseberry could be improved just as much as any fruit that grows. He thought it would be advisable to plant the seed of the gooseberry and raise them every year. A variety that beats the Carson seedling will soon be here. It was highly recommended.

Mr. Burrell said that it had been said that mildew was caused by bacteria, and that the application of carbolic acid would remedy it.

Mr. Gray. We have got to keep on raising seedlings until we get a smooth surface variety. We must work for it till we get it. We will get it if we stick to it year after year. There are thousands of varieties in England. We must have something adapted to our climate, but we cannot except by cultivating seedlings.

VARIETIES RECOMMENDED.

On recommendation of Mr. Busse, the American seedling was placed at the head of the list for general cultivation.

A resolution was adopted to furnish a list of the officers of the society to the American Horticultural Society, for publication in their forthcoming report.

The subject for discussion at the next meeting will be "Apples."

MEETING OF MARCH 14, 1885.

Minneapolis Tribune, March 19th.

"THE APPLE" THE SUBJECT OF DISCUSSION.

*Paper by Mr. Pearce—The Varieties Best Adapted to this Climate—
The Society to be Incorporated.*

The twelfth weekly meeting of the Hennepin County Horticultural Society was held at the seed store of Northrup, Braslan & Co., Saturday afternoon, March 14th. The meeting was called to order by the president, and the minutes of the previous meeting read and approved.

President Pearce said that if people generally better understood the practicability of apple growing in Minnesota we would have an abundance of apple trees in the State. Good judgment should be used in the selection of the proper varieties for cultivation. What is wanted is a tree that is hardy and long lived. Mr. Pearce said he believed that such a tree was in existence, but it was not yet in the market. It was being experimented with by a nurseryman whom he would not name, and he believed the problem of producing an apple tree peculiarly adapted to Minnesota had been solved. But we now have a few trees that are particularly adapted to our climate. This winter has been one of the hardest winters for fruit trees we have had for many years. It has not been confined to Minnesota alone, but has extended to all parts of the country. The cold has been steady without intermission, and has tried our fruit trees as hard as they ever have been tried. We have fruit in Minnesota as perfect as perfect can be. The Wealthy is our favorite apple, not only in Minnesota, but all over the United States. The Whitney No. 20 ranks with any other tree in the country. It is a perfect grower, and Prof. Porter says it is the best tree he has ever seen. We can tie to that as an ironclad. Mr. Pearce then read the following paper:

MR. PEARCE'S PAPER.

If the thousands of farmers and others that have set out fruit trees from time to time, and as often lost them, had ceased doing

so for the time being and turned their attention to the investigation, in the light of reason and science, of the causes of the destruction of their trees, (and it is in the power of every intelligent horticulturist to do so,) and would give the subject a part of his time and attention and make himself familiar with the construction of a fruit tree, its variations and habits in different climates, its sap walls or storage cells, where it deposits its winter food, its air cells or stomata of the leaves and bark, how the food is taken up by the roots, assimilated in the leaves, and, by diffusion, sent to all parts of the tree, they would be in a condition to make apple growing a success in Minnesota. The fruit growers of Minnesota should years ago have made themselves familiar with these important subjects, which is just as essential to them as anatomy is to the physician. A physician's knowledge of the human system should be such as to enable him to assist Nature in keeping off disease, and when sickness occurs, to assist her in making a cure. The learned horticulturist occupies precisely the same position. He should know the soil and location on which the fruit tree will best flourish, what varieties to plant, how to prepare the soil, when and how to cultivate, what application to apply to keep the trees healthy and vigorous, and how to assist Nature to restore them to health, when diseased by neglect or accident. This knowledge is simple, pleasant, and easy to acquire.

You ask how this knowledge is to be acquired. Buy a few books on elementary chemistry and botany, and in your leisure hours study them, and when you understand their contents procure those that are higher. Organize yourselves into societies, hold monthly meetings, and oftener in the winter; have some one that is well acquainted with the subject that you are interested in read a paper or give a lecture, and then let discussion follow. Then put in practice what you learn. Send your sons to college and have them take an agricultural course. They want no Latin, Greek or Hebrew. The country to-day is burdened with lawyers, doctors and ministers who have taken classical courses, and are on the point of starvation.

I have aimed to point out some of the principal organs of a tree, and will now show, as far as I am able, what function each organ performs. Take a live fruit tree at the present time; its roots have been entirely inactive since the ground froze last fall. Since then there has been no circulation of the sap in the tree, and yet the tree, in one sense of the word, is active during each

season of the year. Starch is stored away for winter food in the bud and the millions of sap cells in the bark that are connected with the air cells, or stomata, of the outside bark. Through those air cells from the outside surface of the bark and buds the carbon in the air comes in contact with the sap cells containing starch, gradually changes it to gas, or vapor, and it passes off through the air cells of the bark during winter. This is what prevents a tree from dying, or drying up, during the winter. But in case the starch in the buds and sap cells of the bark becomes exhausted before vegetation starts in the spring, the tree, or the part or parts exhausted, dies. This is erroneously called sun scald, and usually occurs in March, or during a severe drought, when there is little or no moisture at the roots. When the frost is out of the ground in the spring, and the temperature gets up to sixty degrees or more, the starch remaining in the buds, sap cells, and other parts of the tree is, by the action of heat, carbon, and other elements, changed to sugar or sap, such as we find at the proper season of the year in the hard maple and other trees. In a few days after this chemical change takes place, if the weather continues warm, the buds begin to swell and little leaves appear. These receive carbon from the air, and the sap at once flows to the roots and excites them to action, and then the flow of food in solution from the roots ascends through the sap walls of the tree to the leaves. Here it is spread out through the leaves and assimilated, and becomes plant food, by diffusion to the growing parts of the tree, and new cell structures commence to form. This process of wood formation continues till the annual growth is complete, which is indicated by the forming of the terminal buds. Thousands of people here make a fatal mistake, who have the erroneous idea that when the terminal bud is formed the tree is ready to dig. Trees at this time contain but little else than gas and water in their cells, and if they are dug and exposed a few hours to the air will dry up. If a fruit tree is not checked by drought, low temperature, or unusually cloudy weather, its annual growth should be complete by the twenty-seventh of August. Then it commences to lay up its winter food by filling its cells and new wood with starch, and is assisted in the fall by cool evenings and nights, which harden and ripen the wood, and during the heat of the day all surplus moisture in a well-ripened tree tends to congeal and rupture the wood, or bark.

We have now followed the fruit tree through a year and noted

its various changes. Our failures in the past are the result of planting varieties not adapted to this climate. To make a success of the apple we must get our varieties from a climate similar to this in every respect. Our State society realized this important fact years ago, and have succeeded in procuring varieties that are reliable in this climate, and the fruit is both early and late and of good quality, and if properly handled, on the right kind of soil, they will always stand by you regardless of cold. I speak from knowledge, taking the past winter as a criterion. It will be two years before these varieties can be had in quantities. But you must beware of frauds, for many persons will be selling trees, representing them to be what they are not.

At the same time we must not forget our hardy varieties. Whitney No. 20 has done nobly. The Wealthy, the pride of Minnesota, and without a rival in any state for beauty and good quality, still retains its good standing at the head of the list. There is also Duchess, and when we get a few of our new iron-clad Russians trotted out there will be no excuse for not growing apples. The winter has been the hardest on fruit trees we have had for twelve years, and when the facts are known a sad lamentation will be heard in the West and Northwest, and other parts of the country.

GENERAL DISCUSSION.

Mr. Pearce further said that we have some Russian varieties that have been tested both for hardiness and quality of fruit. The fruit is adapted to the coldest climate of Minnesota. They are being cultivated and will probably be ready by another spring. He had examined some of the trees and found them perfect. There are some varieties that seemed to be perfectly adapted to this climate.

Mr. Gilpatrick. What trees shall we set out this year, and how shall we set them and cultivate them?

Mr. Pearce. I can put both hands up and say the Whitney No. 20.

Mr. Gilpatrick. How about the Wealthy?

Mr. Pearce. If you have got the soil they will grow right along. It will be found that our Wealthy apple has stood as well here as in any other state of the Union, and we should not discard it. Anyone that has high clay knolls need not hesitate about the Wealthy. We also have a crab that is very valuable,

the large Yellow Siberian crab. It is as large as the Transcendent, and will keep right along, and for sauce is better than the Transcendent. He did not think it possible for the cold of Minnesota to injure a fruit tree that is in perfect condition. But they may be injured by very cold weather coming on before the moisture had passed out and the wood was perfectly ripe.

Mr. Gilpatrick. Could not this ripening be helped by keeping the ground well cultivated? If the ground is plowed deep around the trees would not they get the benefit they ought to receive? The important thing is to keep the roots so low that they will not mind the heat, and if the ground is well plowed the tree will keep growing steadily. Deep cultivation will keep a tree growing, and it will mature at the right time.

Mr. Pearce. We have a climate here that is worthy the attention and study of every fruit grower and farmer. We mature corn here in ninety days that will take one hundred and fifty days a few hundred miles south of us. It is precisely the same with the fruit trees. The reason is that we have a wonderfully dry atmosphere. We have double the growth in the same length of time, and before we are aware of it the roots of our trees are suffering for a supply of moisture. I have no doubt but that nine-tenths of all the fruit trees in Minnesota have been killed by drought. We have got a dry atmosphere and that is the salvation of our agricultural pursuits.

Mr. Smith. The great cause of the failure of the importations from Russia is that instead of coming from the dry portions of the country they come from the Gulf of Riga. Trees gradually adapt themselves to that particular climate in which they are grown. The man who had an orchard last year and wished to carry his trees through this year ought to have gone to work and started their growth as quickly as possible, and he should have done so in a manner which was easiest for him. But above all he should have kept them growing. A rule that is safe to follow to insure safety through the winter is to keep up the growth until the first of August. I believe that it takes thirty days from the formation of a bud before the conditions are perfect for a second growth. We can avoid the second growth by keeping the tree growing as near to the first of August as we can. If we do that the buds will be in a dormant condition, and by the tenth of September the conditions of temperature will have changed so that there will be a second growth. If we can keep up the continuous formation of wood in the tree until the

first week in August it will go into winter quarters in good condition. The effect of a good plowing lasts at least a week on a tree. I don't think that the extreme cold had anything to do with the injury of the trees. I think that all the trees that were injured were injured before the first of October.

Mr. Pearce. I am positive that if we can keep the trees from being checked by drought and keep them growing until about the first of August, they will commence the process of hardening and ripening the wood, and there is no possibility after that of a second growth. It is my opinion that the only reason of this bad effect on the trees is the early hard cold weather coming on while the moisture is in the trees and before they have been cured. This second growth is almost certain to be fatal to trees.

In planting fruit trees we have got to be governed by the soil. If it is a clay soil I would say about two inches deeper than they were in the nursery. If the soil is very light make it three. If you are setting a large tree the trouble will be that you cannot get it too deep; but if you have the roots sufficiently near to the surface of the ground, they will knit together and the wind can not weave the tree. If the roots are well established, I do not think deep planting should be recommended.

Mr. Smith had planted trees on black clay subsoil, just slightly rolling. He back-furrowed the land into lines twenty feet wide, then ran four furrows in the dead furrow, then three furrows in the dead furrows. Then the men went in with their shovels, and where each tree was to be set they threw the dirt from the middle until they filled it pretty nearly level with the raised ground. Then we set the trees so that when the ground was level the crown of the tree where it was grafted was below the ground. Then we cross-furrowed, and afterward continued to throw the dirt towards the tree until the black loam was at least three feet deep. In building a road there eight years afterward it was necessary to move some of the trees, and there was found to be an abundance of good roots at the bottom, three feet below the surface.

Mr. Smith said that the exposure best adapted to fruit growing in Minnesota is a slightly sloping northeastern exposure, with a gravelly clay soil. The nearer we can get to that the better.

Mr. Busse. Trees from two to four years old are the best to set out, but three years are the best. As for distance I should set them fourteen or sixteen feet each way. I would set Tran-

scendents sixteen feet apart, but the Wealthy, Duchess and Whitney No. 20 I would not set more than twelve feet apart. When the trees are too far apart they don't protect themselves.

Mr. Pearce. In regard to mulching, I don't think fruit trees should be mulched right up to the tree. A space should be left around the tree for eight or ten inches. As for blight in Transcendent trees I think that it can be entirely stopped by simply putting straw under the trees over the roots, in the fall or early in the spring, letting it lie the whole summer. The only trouble with the Transcendent is the blight.

As regards trimming Mr. Smith said that it should be used as medicine for a sick man. If there is a necessity for trimming, then trim. But if a man is going to raise an orchard he should do it without trimming. Take the sprouts off when they are little. Never use a knife when you can possibly avoid it. When a limb is in condition to make it necessary to cut it away, the best time to do it is during the season of rapid growth. If you are going to trim because of ill shape, the best time is about the first of June. But above all, take the trouble to wax that cut over smoothly just as soon as you have done it. Everybody who can afford to have an orchard can afford a few pounds of grafting wax. To make it, take a quarter of a pound of tallow and one pound of resin. If you want it nicer you can put in some beeswax.

VARIETIES RECOMMENDED.

The Duchess and Wealthy were recommended for universal planting, and the Tetofsky in limited quantities.

For hybrids the Whitney No. 20, Beach's Sweet, the Orange, and Quaker Beauty were recommended.

For crabs, the Transcendent, Hyslop and Virginia were recommended. For the extreme north, the large Yellow Siberian, which grows where others fail.

It was decided that the meetings should continue for two weeks longer, and that at the next meeting the subject of "Grapes" should be discussed.

CHANGE OF NAME.

It was decided to change the name of the society to the Hennepin County Agricultural and Horticultural Society, and the

officers were instructed to take the necessary steps to have it legally incorporated.

Professor L. Asire offered the society the use of his new Northwestern College of Commerce rooms free of charge. The rooms will be ready for occupancy about the first of September. The professor's offer was accepted with thanks.

It was voted to return the thanks of the society to Northrup, Braslan & Co. for the use of their store for a place of meeting heretofore. The society then adjourned for one week.

MEETING OF MARCH 21, 1885.

Minneapolis Tribune, March 26th.

THE GRAPE AND ITS CULTIVATION.

The Best Varieties and How to Cultivate Them—The Name of the Society Changed, and Articles of Incorporation Filed.

The thirteenth weekly meeting of the Hennepin County Horticultural Society was held at the seed store of Northrup, Braslan & Co., on Saturday afternoon, March 21st. The minutes of the previous meeting were read and approved, after adding the Early Strawberry to the list of hybrid apples.

President Pearce said that the weekly meetings had been very satisfactory, and productive of much good, and that if the society was as prosperous in the future as it had been in the past, its influence would soon begin to be felt abroad as well as at home. He then announced the subject to be considered was grapes, and asked Mr. C. L. Smith to give the results of his experience in grape growing.

REMARKS OF C. L. SMITH.

Mr. Smith. I think we have made somewhat of a mistake frequently, in planting grapes in this State, by following too much the ideas formed in other localities. I have become satisfied from observation that the lighter sandy soils of Minnesota are better adapted to successful grape growing than the heavy

soils, while a hillside and southern exposure is preferable. I think that I would take level land in preference to a clay hillside. My idea used to be that a clay hillside underlaid with limestone was the best possible exposure for grapes. That is true in the East, but in Minnesota I think the sandy land is preferable. I believe that if it is worth while to plant grape vines at all it is worth while to go to considerable expense to prepare the ground. I would trench the ground in rows running north and south, eight feet apart and at least three feet deep. The expense of properly preparing the ground is a very small item in comparison with the increased yield. If I were to plant on level sandy land, I think I should trench at least eight feet deep and three feet wide. I should fill the trench with stable manure, and at least ten loads to the acre of refuse from the butcher shops, and the last two feet with good soil mixed with sand. I would plant the vines over that trench, planting them about six feet apart. I would plant the Concord seven feet, the Delaware five feet, and the intermediate varieties about six feet; making the average about six feet. I think it is a mistake to go to the expense of poles and wires for at least eight years. I would keep the vines back and not allow them to fruit for the first three years. I would secure two-year-old vines grown from old layers. I consider them the best vines for planting. They certainly will come into bearing earlier, and are more sure to live than any other vines I have ever planted. I would cut away about half of the root and all of the top but two or three of the highest, and let those set up above the ground, being careful to firm it well in. There is no necessity of watering, simply pressing the ground well in. The first year I should pinch off but one bud. In the fall I would cut them back, the Delawares about a foot and the Concord about twice that. Cover them with earth, and over the earth a mulching of stable manure. Leave that on until the leaves begin to start in the spring. Then uncover the vines and let them lie on the ground for the first ten days or two weeks. Provide stakes three or four feet long and drive in and tie the vines up to them. I would let two new buds grow from as near the ground as possible, and let them run on the ground the first year. I would cut these back at least a foot, and if they were not very strong, about six inches. The next year I would have fruit from those new vines. I would encourage two new buds from as near the ground as possible each year. I would not practice what so many do, that is summer pruning.

All the summer pruning I did I would do about the first of June. I would pinch off all the surplus vines but one or two each year. I would not pinch the buds of the fruit laterals. It is sometimes practiced, but I think it is to the detriment of the vines to pinch after the third leaves. But I would not allow the wood vines to make more than two or three shoots each year, pruning in October and November and laying flat on the ground and covering with earth. Should cultivate with plow cultivator and hoe. About the first of June each year I should cover the ground at least three inches deep with horse manure. I can say that in seven years we never failed to ripen our Concord grapes before frost, when we had three or four inches of stable manure put on before June. If it is cold and rainy I would wait until the middle of June. Just as soon as the rains have gone and the ground begins to dry, cover it with three or four inches of stable manure, and that ends the cultivation for that year, and the vines go into winter quarters in good condition. The man who leaves a large quantity of wood on his vines don't want any grapes next year. If you want a successful vineyard don't let the vine fruit the first year, and then again don't let it fruit to death the third year. It is best to cut away not more than ten bunches the third year. I think that if the ground is prepared as I say and the vines cared for properly and then heavily manured with horse manure in June there will be no trouble in producing large, well-ripened Concord grapes in Minnesota. The Delaware will probably after four or five years produce more grapes than any other variety that has been tried, but I would not discard the Concord. Moore's Early, I believe, is the coming grape for this climate. But at present the vines are scarce, and we have hardly tested it sufficiently to say to everybody, "Plant it." On sandy land, using the horse manure and forcing them along, you can get ripe Concords the first year.

GENERAL DISCUSSION.

Mr. Foster said he would proceed just about the same as Mr. Smith.

Mr. Gilpatrick said he could not suggest anything different from Mr. Smith's plan.

Mr. Smith. When a man has not got anything else than clay land I would not tell him to raise grapes. But of both kinds of soil I would prefer sandy. With the experience that I have

had, I should expect better success on the sandy soil of South Minneapolis than on the banks of Minnetonka. Grapes can be produced well in almost every place they have been planted in the State.

Mr. Pearce. I don't think there is any trouble growing grapes on sand. I think they will mature earlier on sand than on clay. The soil around Minnetonka, as a general thing, is a clay soil. I have observed for years that grapes and apples have done better on that soil than they have on the sandy soil. The apples on that high clay soil are in good condition. South of the lake the soil is a deep red clay. I think a week or ten days can be gained on sandy soil. At the same time, if I was going to set out grapes, and had a clay hill sloping to the south, I would choose it in preference to other localities. Heat is what we are after. I have known grapes to stand still for weeks after they were almost ripe because there was not heat enough to ripen them. In regard to varieties, I have planted the Delaware and Concord universally. About one-quarter of the Concords have ripened, and the balance have been sour. I think we ought to look very carefully to the locality of the vineyard, and suit the varieties to the locality. Concord and Delaware grapes are grown because they are universally known. Some people will send for Concord grapes, no matter where it is. I believe that Moore's Early will ripen in this climate. It is not a heavy bearer, but it is a good one, and the fruit is fully as large as that of the Concord. The grape is sweet and will command twenty-five cents a pound. From the best information I can get the Early Victor, a large black, is highly recommended. There is no excuse for a man saying he has not got the proper soil for raising grapes. If he will post himself on the different varieties he can get grapes that are adapted to his soil and will ripen there.

Mr. Grimes. The ground on which my grapes grow is hardly suitable. Some years they grow well and others they do not. I have planted the Concord, the Delaware, and the Hartford Prolific. The Delaware is a very good grape, and has given me as much satisfaction as any I have grown, but the Concord has produced the most fruit. My soil is clay, and only moderately exposed to the sun. It is a heavy soil and not calculated to ripen fruit as well as some other localities. I tried a few of Roberts' hybrids, but they were not satisfactory. As a general thing I would say that the extra early varieties are not as good in quality as the later kinds.

Mr. Smith said that he considered that a green Concord was about as good as a ripe Janesville.

Mr. Gilpatrick. I have never failed in ripening Concord grapes in the twenty years I have grown them. I cultivate early and thoroughly, and never have lost a crop of Concord grapes. But when I do not cultivate for two weeks I find them behind. I have given my grapes a great deal of cultivation. My experience seems to have been different from anyone else.

Mr. Smith. We have only lost one year since I have been in the State, and that was last year.

Mr. Grimes. If I was going to start a vineyard I would put out half Concord, but I should have more faith in cultivation than most men. I know a man that raised grapes on ground that was eleven feet subsoil—bones, horse manure and everything else. The ground was worked eleven feet. No water was used. Cultivation was once in two weeks. That man put out a vineyard to have grapes to eat. When I was there a few years ago they were the best crop of grapes I ever saw. I have never lost a grape yet. I have been planting the Rogers grape ever since I have been here. In setting out grapevines I would have the ground worked three feet. Good cultivation will pay. In Massachusetts, where the land was cultivated two, three, or four feet, the crop paid just in proportion to the depth.

REMARKS OF JOHN S. HARRIS.

Mr. John S. Harris, of La Crescent, Minn., said: The best soil for grapes is what we call a sandy loam, that has a certain amount of clay in it. The next best is a clay loam. A man at La Crosse had a strip twelve feet wide, on the north side of his garden, dug out two feet deep, and put in fertilizers, and the grapes grew well, but you cannot succeed with very sandy land on a side hill. If grapes are put on a sandy hill they will fail. Where the soil is sandy it is absolutely necessary to put on bones, etc., occasionally, as a top dressing. There are a great many who may dig a hole just as small as they can work in, two or three feet deep in the hardpan, fill up with fertilizers, and then set out the vines. They will grow a year, or perhaps two, but after that they will grow less and less each year, and finally will stop growing entirely. In setting out vines do not dig the vines any deeper than the ground has been stirred, so that the roots will start right and get an easy living in clean cultivation. There is more

in that than some people think for. When the August and September weather comes on, the ground should be warm; if there is a great mulch of weeds, the sun will not touch it at all, and the grapes will be later. Doctors disagree in regard to pruning. Commence to pinch back when the vine gets out three or four inches. You take off scarcely anything, and so it gets no check. The seed will start again, and when it forms two leaves give it another little pinch. It is not the sun and yet it is the sun that ripens the grape. The sun shining upon a grape will never ripen it, but the action of the sun shining upon the leaves is what ripens the fruit. As far as I at present know, in a region where the Concord ripens, we will find at least half of that variety. I believe that the Worden is nearly as good as the Concord, and I think it is a little earlier, but I want a few years more experience before I tell everybody to plant that variety. The Worden is not as productive as the Concord. There is another variety that I have tested that matures early, about ten days earlier than the Concord. If I was where the Concord would not ripen, I would plant Moore's Early, and if I lived in a region where I could not raise those, I would raise grapes anyhow, and would plant out the Champion or the Janesville. We only recommend these for places where other varieties will not ripen. The Champion is a very poor grape. It is the poorest grape we have ever had put on us. It is a very vigorous grower and early, and if you can't get anything else you can grow them. In planting the Concord I would endeavor to put them on a side hill, the steeper the better, if it slopes to the south. I would work it up pretty deep, and if I had to have it on level ground I would put up a board fence. A farmer might raise a vine or two on the south side of his barn. I have no doubt but that some of the new varieties would be valuable to us, but I would not recommend a farmer to try any of them. I have not grown the Victor, but from reports I think it is a good grape. I think there are half a dozen different varieties earlier than the Concord. I think it would be advisable to try a vine of the Niagara, but would not advise anyone to try many of them. It comes to us so well recommended that I have a good deal of hopes for it. But it did not originate in Minnesota, and may not be adapted to our soil. There is one advantage in the Worden, and that is that it is ready to eat before the Concord is. The Delaware will keep longer than the Concord. One of the very best grapes for keeping is the Catawba. So is the Rogers No. 4, the Rogers No. 15, and the Salem. The Diana is a very uncertain grape to

grow, as they have a great many green ones in the bunches. The Concord will only keep about ten days after it is picked.

DISCUSSION CONTINUED.

Mr. Gilpatrick said the Rogers No. 4 must be well cultivated or it will not bear good.

Mr. Northrup inquired when the grapevine was in its maturity.

Mr. Harris said from six to twelve years.

Mr. Northrup asked what was the lifetime of a grapevine.

Mr. Harris. If renewed occasionally, perhaps one hundred years. We have none here as old as that, of course, but it is claimed that they will endure for a hundred years. But the best in the vineyard are the four-year-old ones.

Mr. Gilpatrick said he had vines that he set out twenty-two years ago, and they had borne every year. He trimmed them back a little every year.

Mr. Harris. I believe in dropping vines down on the ground and covering them enough to protect them in the winter. Dirt is good to cover them with, but cornstalks are the best thing that can be had. I never had vines injured by mice, but I keep two or three cats on the place, and frequently take an oyster can with one end cut off, and put meal with strychnine in it, and put them out in the field, and put a little brush over it, and the mice will feed on that, and they don't want anything else.

Mr. Pearce. It is almost the universal practice in this climate to bury grapevines in the winter with earth. I have tried blackberry bushes by putting them flat down with a weight, and they winter without any protection. I can take a rosebush and lay it flat on the ground, without cover, and winter it perfectly. It is better, I think, to throw a little earth on them.

VARIETIES RECOMMENDED.

The Concord was recommended for general cultivation with moist, warm soil and southern exposure, or in quick sandy loam.

For the same soil with high cultivation, the Delaware was recommended.

Moore's Early was recommended for planting on any good corn soil.

Rogers Nos. 4 and 15 were recommended in limited quantities with high cultivation.

For trial, the Early Victor, Brighton and Duchess were recommended.

A NEW NAME ADOPTED.

Mr. Grimes made a report of his investigation in the matter of the incorporation of the society. The articles of incorporation will be filed immediately.

The action of the association at the last meeting, changing the name, was reconsidered, and, after considerable debate, the name of Hennepin County Horticultural Society and Gardeners Association was determined upon.

MEETING OF MARCH 28, 1885.

Minneapolis Tribune, April 2d.

Commercial Fertilizers and their Advantages—Articles of Incorporation Signed—The Meetings Adjourned until June.

The fourteenth regular weekly meeting of the Hennepin County Horticultural Society and Gardeners Association was held at Market Hall on Saturday afternoon, March 28th.

President Pearce announced the subject for discussion to be "Fertilizers." He said: We have never given that attention to fertilizers that it is to our interest to give. There are many persons who do not understand the advantages of fertilizers, and the fact is that for a half or a quarter of the expense they are now put to they can raise double the amount they do. We want an expression from all on this subject. If anyone here has had any experience in this matter we want to know the result of that experience. If it is possible for only a half or a quarter of the expense to bring about the same results it is to our interest to know it and put it into practice.

Mr. Braslan. I agree perfectly with Mr. Pearce when he says the society should be free in its opinion. In this country, which is growing so rapidly, there is a subject which should interest every farmer, and that is the subject of fertilizers. In New England farming cannot be carried on successfully without the aid of fertilizers. There are farmers here who haul manure from great distances to fertilize their land. The expense of that fertilizer is greater than that of any brand of fertilizer manufac-

tured in this country — that is when taking into consideration the expense of hauling. The head of a certain fertilizer company, the largest in the world, is very desirous that their fertilizers should be used here, and will make special prices, so that we can have a chance to try its merits. I think every farmer here should be ready to express his views in the matter. I know pretty well the effects of the different kinds of fertilizers, but would like to hear from others who have had experience with them.

Mr. Northrup. It seems to me that the most inexperienced of us realize that we have got to have some kind of fertilizer, and such being the case we should consider the advantage of a commercial fertilizer over stable manure and its freedom from foul seed and other foreign substances. Everybody can appreciate the importance of this.

Mr. Braslan cited an instance where 2,558 pounds of potatoes had been raised from one pound of seed by the use of a commercial fertilizer.

Mr. Gray said that he used stable manure because he could get it handy, more than anything else.

Mr. Northrup inquired of Mr. Gray what he considered the expense of properly manuring an acre of land for a general crop.

Mr. Gray. You cannot make a definite price, because sometimes you can get manure that is very close to the farm and sometimes you cannot. Last fall I paid a man a dollar a load for drawing. I never saw land too rich to take fifty tons to the acre; sometimes it is better to put on seventy-five. The idea that land never requires manure is all nonsense. Land may be very rich but I always claimed that it still required some kind of fertilizer. It is all wrong to think that land may be too rich. It may be richer in one place than it is in another and may require evening up. As to the cost of manure it is a question that cannot very well be answered.

Mr. Pearce. Do you get any foul seeds in the manure?

Mr. Gray. Oh, yes; lots of them.

Mr. Braslan. How long does it take freshly made manure to become incorporated with the land so that it will be valuable?

Mr. Gray. I don't think much good can be got out of it the first season.

Mr. Braslan. If you were raising onions would you think it would cost thirty dollars an acre for manure?

Mr. Gray. Yes; it would cost all of that.

Mr. Woolsey. What guarantee can we have that patent fertilizers are worth anything?

Mr. Braslan. You have the guarantee of a man that has had half a century's experience in the business. You have the guarantee from farmers in New York, Pennsylvania, Ohio, all over the South, and from New England, and that they could not run their farms without fertilizers, especially those farmers that have land that is worth from six hundred dollars to eight hundred dollars an acre. I know from experience in several cases where manure has been used on one piece of ground and a fertilizer has been used on another, and where the fertilizer has been used it has produced larger crops and potatoes that were free from scab, which is always present on potatoes that are raised on land where manure is used. It makes an improvement in the looks of vegetables, and gives earlier and more abundant crops.

Mr. Woolsey. We have nothing in our State to protect us from fraud, but in some of the Eastern states there are provisions made for analyzing these fertilizers to see if they are good. But it is sent here, and we have no assurance that it is not a humbug. If the manufacturers would guarantee that what they sell is worth the money they represent it to be, it might be of some use to try it. I have seen it used, and know that it is a good thing, but until we have some guarantee that these fertilizers are genuine we had better let them alone. There are tens of thousands of loads of manure going to waste.

Mr. Braslan. Makers of fertilizers will give a written guarantee that the goods are what they are represented to be.

Mr. Gray. Manure brought out of the city contains all kinds of rubbish and we have no use for that kind. If the people of this city took the same care of their manure that they do in some of the Eastern cities and in Europe it would be another thing. It will then not only be worth drawing but will be worth paying something for. As between the manure picked up in the alleys of Minneapolis and the commercial fertilizers I think the fertilizers are certainly to be preferred.

Mr. Pearce. When you take from the ground more than you put back you rob the soil. There are persons who make a life study of these ingredients of the soil which are necessary to plant life, and have produced fertilizers which embrace all the properties that are needed in the various vegetables. Instead of returning to the soil in wagon loads what is taken

from it, it is reduced down until a pound represents a wagon load. The soil then produces what it did when it was virgin soil. A man that produces, year after year, crop after crop, without fertilizing, is a robber. Fertilizers have become in many parts of the country an indispensable article. The South to-day would not be worth much if it were not for fertilizers. We are rapidly drifting to that point ourselves. It is our duty as an agricultural State to turn our attention to these fertilizers and make them a study.

Mr. Hodgson. It is true that we are in some respects robbers when we crop land year after year without putting something into it. After we have drawn all the deposits that nature placed there, we must then ourselves make deposits before the land will honor our drafts of wheat, corn and potatoes.

Mr. Smith. The most important point to be considered is that these fertilizers can be used at times when it is not practicable to use the coarse manures. It is safe to say that cow manure and horse manure will not show much effect before the first of July. They do not get into a condition when they will be of any benefit before the hot weather. The fertilizers act immediately. It is a question of very great importance to us and to the whole State, and members of our society should, during the coming year, make some careful experiments, manuring with stable manure such as is ordinarily obtained, taking account of the amount used and the cost, and then on an equal amount of ground use some of the concentrated fertilizers and very carefully note the results. In this way, in another year we can determine the relative cost and advantages of the different kinds of fertilizers. I don't see how we can get anything definite in any other manner. The more concentrated the form of the fertilizer the greater the percentage of profit the farmer will derive from it. We ought to determine what particular kinds of fertilizers are best adapted to our soils and climate. I am satisfied from what experiments I have made that on wheat and corn in this State we can add a very large percentage to the profit of the crop by using some particular fertilizer adapted to that particular crop and the soil that it grows on. I have no doubt but that by the liberal use of fertilizing salt the wheat crop of Minnesota could be increased thirty per cent, and of that you gain at least twenty per cent profit. Wherever the salt has been used the result has always been beneficial, and yet I presume there is not one farmer in a hundred in this State that will use fertilizing salt this year,

although the expense is less than one dollar an acre, and the added profit, so far as has been reported, has never been less than five dollars. I am speaking of salt as a special fertilizer for wheat.

Mr. Pearce. Animal life is higher than plant life. Plants subsist entirely on elaborated food. The food is taken up in solution from the earth. When it passes into food, that is, when it becomes food for the growth of the plant, it changes. The fertilizers are prepared plant food. It is taken up by the plants without going through the process of preparing it. If you want very early vegetables, use the right kind of fertilizers.

Mr. N. G. Abbott. We have tried fertilizers, and have seen a very decided effect the first day after they were put on. When our plants are a little slow we get some plant food and put it on and they start up immediately.

There was considerable further discussion of the subject, but nothing more of importance was brought to light.

At the suggestion of Mr. Braslan, a motion was adopted requesting the Bradley Fertilizer Company, of Boston, to furnish to the members of the society samples of their goods for trial, with the understanding that they will make a fair report of the results obtained.

The articles of incorporation were read and adopted, after which they were signed by the officers and members of the society.

This will be the last meeting for the present, the next being on the first Saturday in June.

LETTER FROM PROF. J. L. BUDD.

AGRICULTURAL COLLEGE,

AMES, IOWA, May 13, 1885.

Mr. S. D. Hillman,

MY DEAR SIR: Many thanks for the advance sheets of your very valuable report.

Permit a word in regard to Mr. Tuttle's report on Russian apples. I am sorry he gave a verbal report, as such talks are rarely reported correctly. It was in consequence of a failure to report me correctly that gave rise to the impression on his part that on my return from Russia I had said Mr. Tuttle's varieties were either north German or Russian sorts grown near the Baltic.*.

* See page 133.—SEC.

What I did say was that Dr. Regel, in 1869, was a much better botanist than pomologist. When he sent the great list of varieties to the Department of Agriculture at Washington he was experimenting with near two hundred varieties of the apple, from Dr. Lucus, of Reutlingen, and with about two hundred more from Lithuria, Dorpat, Vilna, and other points too near the water.

Yet this great collection forwarded by Dr. Regel contained a number of valuable sorts grown in Central Russia. These Mr. Tuttle has diligently been sorting out for the past fifteen years, and he has added to them by direct importation from Moscow. I knew all this before I went on an exploring trip to the great east plain, and regret deeply the impression of Mr. Tuttle that I do not unite with the whole North in thanking him for the importance of advance work he has been quietly carrying forward at Baraboo. In this great work of adapting fruits to the prairies of the immense Northwest we need united effort. Mr. Tuttle has aided our work by kindly forwarding cions of most of his varieties, and in turn we may be able to aid his work by the correction of nomenclature and in the way of finding out where this or that variety will succeed best.

Our inspection of Russian orchards in many provinces, and long talks with the best pomologists of the steppes of Europe, will aid materially in proper naming and distributing the many varieties of the families of Russian apples to which Mr. Tuttle refers. He is slightly mistaken in the belief that not much is yet to be done in the way of introducing best sorts. As an instance he speaks of Lord's apple. This is not the true Herren apple of Livonia, but is a member of the great family known as Arabka. Again he says he has all of the Anis family we name. Of the department list the only true Anis I have seen is No. 382, which Dr. Regel called Bufkaja Selonka, and this is not the fine red Anis of which we saw tens of thousands of bushels on the Volga. The Selonka of Central Russia is a yellowish green, winter apple, and a member of the great family known as Sklanka, all of which are winter sorts. Our collection contains very many varieties from the black soil sections of Central Russia, selected by such experts as Dr. Fischer, Dr. Tretjackoff, and Dr. Shrader. These will be the tests in the much needed correction of the Russian nomenclature. The report of Mr. Gibb, of Quebec, on this subject will give some idea of this great work.

I have started a large ledger in which is opened an account

with the varieties we send out, and the varieties received from all sources, of apples, cherries, pears and plums.

We need aid in this work, and hope that specimens of Russian fruits grown the coming season in Wisconsin, Minnesota and Iowa will be forwarded in proper season. Perhaps it may take ten years to complete the big ledger, but the ultimate publication of this record cannot fail to advance our horticultural interests.

Yours fraternally,

J. L. BUDD.

VINES FOR OUR HOMES.*

BY MRS. D. HUNTLEY, APPLETON.

The climbing vines are Nature's drapery, and with them she covers beauty and deformity alike with a mantle of loveliness. Nothing that art can produce can equal their elegant grace. "As the lilies surpass in beauty the robes of royalty, so these tender climbers surpass all the decorator's skill." Every tree and shrub of the forest takes on new beauty when entwined and caressed by the clinging tendrils of the Ivy or the Clematis, and the vine-clad trees and vine-covered doorway become a picture in the landscape which we never forget.

It is often said, "you cannot have something for nothing," but we come very near proving the saying false when we deal with Nature. If we plant the tiny seed, or set the roots of vines by window or doorway, by rustic arbor or trellis, and then do just what all have ever done who have accomplished anything good or beautiful, wait, wait and see what Nature will do for you; the vines will grow while you are waiting, and soon, without money and without price, your home—whether lofty or lowly—will be adorned with Nature's finest drapery, and neither rain nor sunshine will ever deface it.

The easiest way to secure vines for the home is to plant the hard-wooded, hardy climbers. They will live many years with little care, and become more beautiful with increasing age. The best of this class is the *Ampelopsis Quinquifolia*, now everywhere known as the American Ivy. It grows so easily and rapidly that there is danger that we shall fail to appreciate its

* From Wisconsin Horticultural Report, 1884.

worth. The late lamented Mr. Vick said: "This vine has done more to beautify rural villages than any fifty plants in existence." It is highly prized in Europe, where it is largely used in preference to English Ivy. The latter often becomes rusty and bare, while the American Ivy has immense foliage, and needs no special care, unless it should be necessary to cut back its rampant growth. We often see this beautiful vine adorning city homes, but many of the people of the country have not yet learned how attractive their dwellings could be made by the Ivy, which grows wild on their own farms.

The climbing Bitter Sweet, *Celastrus Scandens*, is a hardy vine, and in many places can be found in the forest, but it is not so often used for the porch and piazza as the Ivy. We know one city home where the Bitter Sweet was saved when the forest was cleared for the dwelling; it has become an immense vine, of great beauty. Its foliage is handsome, and its berries of scarlet and orange are very showy, and much prized for winter decoration.

Another hardy vine is the Moonseed, so called from its crescent-shaped seed. This, too, grows wild in many places in our State. It is a slow grower, but in time becomes large and handsome, and in autumn has clusters of purple berries.

The wild Clematis, which is very abundant in the woods, seems quite at home when transplanted to our gardens. It is not so hardy as either of the other vines mentioned, and will sometimes winter-kill nearly to the ground, but its growth is so rapid, it soon covers any support with foliage, and in summer is a mass of sweet, white flowers that are very lovely. There are many varieties of Clematis, both wild and cultivated, that are very desirable. That known as "Travelers Joy" we have had several years in the garden, and in the most exposed situations the roots survived our severest winters. No objection can be made to this vine on account of injury to buildings. If better known it would be greatly prized.

The Matrimony vine, with its willow-like streamers, is a pretty thing in appropriate places, and in some localities is very abundant. We have always admired it, at a distance, for it has persistently resisted all our efforts to make it grow in the garden.

All these can be easily obtained, are very ornamental, and best of all, when once planted, you will always have them. They can be trained upon the buildings, on a rustic arbor or cross in the dooryards, and, in any of these places, give pleasure when-

ever run. There are many other good climbers which are more rare, such as "Dutchman's Pipe," "Trumpet Creeper," "Climatus," and many others which, if one has room and time for their culture, will be found very satisfactory.

Then there are a large number of herbaceous perennial climbers which die to the root in winter, and every spring come up again to gladden us with new beauty, and long before the end of summer give a wonderful growth of foliage and bloom. Of these the "Cinnamon vine," "Chrimyam," and "Madeira vine" are most common. The roots of the latter must be taken up before the ground freezes. Among this class of plants there is a vine with halberd-shaped leaves, and large, double, rose-colored flowers, which is sometimes called the "Rose Creeper;" it grows wild in many places, and is sometimes considered troublesome, but with good culture it can be kept from spreading, and when well trained it makes a pretty screen. Another wild vine with very similar foliage, has pure white flowers much like the Morning Glory. This was one of the vines that in our childhood we called the White Creeper. Then it was our admiration; we remember one eccentric old lady who trained it through her window and around her tall old-fashioned clock, but we had never seen it in the West, till one day last summer, when returning from the home of our worthy president we passed the "White Creeper" of childhood's memory in the woods near the Oneida settlement. With tenderest care we took it in our garden, but all our efforts to make it live were unavailing.

Besides the perennial vines we have a large number of annual climbers which all can have even in new or transient homes; wherever spring finds us, the little packet of seeds may be planted, and long before the summer is gone we have a profusion of flowering vines. First among them are the dear, old Morning Glories. There never was, nay, never will be, any vine lovelier than these glories of the morning. Then the Nasturtium with its golden and scarlet bloom, spicy stems, and curious seeds; and the canary vine, with its little bird-like flowers perched about among the pretty foliage; and the sweet peas, too, with their delightful fragrance. O, who could be content without these reminders of the old home gardens? Then we have the newer vines, some of them of surpassing loveliness, and they must have a place in the conservatory or veranda. Passion vines, Cobia Scandens, Star Ipoima, the delicate Cypress vine and the Golden Thunbergia are all easily grown, but for constant

growth and beauty there is nothing equal to the English Ivy and the wax vine, *Hoya Carnosa*. An old plant of the latter has been in bloom all winter, sometimes bearing thirty clusters of its waxy flowers at one time. Both these vines need much time to perfect their beauty, and when there is any danger of frost the quicker growing vines are much more satisfactory. Of this class the German ivies are best. It is said by some writers that these are not ivies, but they have so long borne the name we think them entitled to it by possession.

The variegated German Ivy, "*Senecio Scandens*," is much like the English Ivy in appearance, has thick, glossy leaves, and is a rapid grower. The common German Ivy is the best vine for the wall in partially shaded situations that we have ever seen. It will grow many yards in length and cover a large space in a few weeks. A pretty way to grow this ivy is to train it around an oval frame of wire or rattan of any size you wish, and, when well covered with foliage, take vase and frame to the parlor to decorate a picture.

For hanging baskets a well grown ivy is very handsome; so also is the *Maurandia*, and if the three colors, white, pink and purple are grown together the effect is very pleasing.

Another excellent vine for baskets and a comparatively new one is *Pilogyne Suavis*. This is a rapid grower. The leaves and tendrils resembling the grape; flowers are small and cream-colored. But of all the vines the *Smilax* is the daintiest thing for all decorating purposes. Its glossy leaves add grace to everything it touches.

The *Smilax* is prettiest grown in some ornamental pot or box that can be easily moved. Each vine should be trained on a separate string. When needed for decoration, part can be used without injuring the whole. When the vine is well grown take it to the parlor to adorn a picture, or place it at the window at the edge of a lace curtain, taking care not to keep it from the sunshine.

Another exquisite little vine is the climbing fern, *Lygodium Scandens*. This is not so common as the *Smilax*, but wherever grown it is thought to be fully its equal. Its foliage is airy and graceful, and when cut will remain fresh a long time. It is best grown in the manner described for *Smilax*.

Besides the climbers there are a large number of trailing vines which are indispensable for baskets or boxes, or in any place where a drapery of foliage is needed. Of all this useful class of

plants, if we could have but one, it should be the Kenilworth Ivy, which will grow anywhere, requires but little earth, and will cover brackets and baskets with a curtain of green. A tiny part of this pretty trailer upon a bracket is a fine ornament for any room.

The Tradiscantias, also, are among the best of trailing plants; they will grow beautifully where there is not a bit of sunshine. There are four varieties of this plant, often called the "Wandering Jew." The newest is the pink, white and green; this is a wonderfully attractive thing, and in a basket with the other varieties would be charming. Some of the Sedams are good for this purpose.

Then we have the garden Moneywort, which will grow yards in one summer, and the old ground ivy, which some think a pest, but we like it for its old time, suggestive name, "Up the Hill to Happiness," by which our grandmothers called it.

But time would fail to tell of all the lovely things which we find everywhere around us in boundless profusion. We pause in wonder when we contemplate the beauties of the floral world, and can only exclaim,

O! who that has an eye to see,
A heart to feel, a tongue to bless,
Can ever undelighted be,
With Nature's magic loveliness.

A QUARTER OF A CENTURY OF FAILURES IN FRUIT CULTURE.*

BY A. W. SIAS, ROCHESTER, MINN.

Some one has said of the poet Tennyson, that his "vanity, egotism and self-absorption are so great as to leave no room for manners." Now, while I do not covet such a reputation as this, I am at a loss to know how to relate all our failures without talking much about myself, and in that case, of course, I might be mistaken for an egotist; but as I have the enviable reputation of being a modest member of the Minnesota State Horticultural Society, I shall try hard to maintain this distinction, of which I am so justly proud, as this is a rare bird on our side of the river

* From Wisconsin Horticultural Report, 1884.

among "Tree Peddlers." This is the first opportunity I have had of meeting in connection with this society, although I have been slowly plodding along in this good work just across the "Father of Waters," for about twenty-five years, and after meeting in our own State such worthy members of your society as President Smith, Geo. Pepper, A. J. Phillips, E. Wilcox, J. C. Plumb, and others, it is not strange that I had looked forward to this meeting with high anticipations of pleasure and profit. To undertake to show up all the failures that we have met with from time to time during the past twenty-five years would require all the time usually devoted to one of your winter sessions.

The first cause of failure that came under my observation on my arrival in Minnesota was that of planting trees that originated in New England and the Middle States, none of which proved of sufficient hardiness to withstand our higher and dryer climate.

2. One great cause of failure was lack of care and cultivation, allowing the trees to dry up during seasons of drought. Have never yet seen an orchard in our State that was plowed and cultivated as much as it should have been. Every time you plow and drag an orchard you destroy millions of insect eggs, and at the same time kill myriads of insects that play such sad havoc on both tree and fruit. Thorough cultivation serves the double purpose of ridding the soil of injurious insect life, and bringing the trees safely through a season of protracted drought, which without such thorough cultivation sometimes causes the death of more trees than our most severe winters. There is no *substitute for moisture* in the orchard; it must be constantly kept up or your trees will surely perish. The more you cultivate, the better is the soil prepared to utilize the moisture from the atmosphere, and in no other way can you successfully combat the oft repeated objection that Minnesota is too high and dry for successful fruit culture.

3. Failures caused by locating orchards in low, frosty valleys, and in many cases too closely and heavily sheltered by tall forest trees, thus shutting out a free circulation of air, which is so essential in districts subject to blight. Have seen rows of Duchess blighted to the ground in such unfavorable situations, and have never known them to suffer the effects of blight in any other locations.

4. Another prolific cause of failure in Minnesota has recently been found to consist in planting too many Siberian crabs and

hybrids, so called, thus furnishing the best possible plants, as far as we know, for the successful propagation of the blight, and at the same time crowding the market with fruit, as a rule of inferior size and quality, that will seldom command over one-half the price of a good, standard apple. When Chas. Gibb, of Abbotsford, Province of Quebec, and Prof. Budd, of Iowa, shall have succeeded in bringing our long list of Russian fruits out of the mist and fog that surround them, and shall have boiled them down and *seasoned* them to our taste, *then* I predict we may safely substitute them for our Siberian crabs. Yes, and for the most of our so-called hybrids, too.

REPORT FROM WILLIAM SOMERVILLE.

Under date of May 17, 1885, Mr. Somerville, of Viola, Olmsted County, writes:

“With regard to the condition of fruit trees, would say that one can now determine with some degree of certainty as to the amount of injury sustained from the severity of the weather of the past winter. It was the most trying winter to trees in orchard ever experienced, with a single exception, during a residence here of twenty-five years. From recent examinations, find that my Russians, of which I have about fifty varieties, have withstood the test remarkably well, and most of them are comparatively uninjured, either in twig or bud. Duchess, with me, is all right, also most of the hybrid varieties; Haas virtually dead, although it has heretofore proved to be hardy in this locality. Elgin Beauty shows the least injury of any of the Minnesota seedlings; is less affected than Wealthy, which gives indications of more or less injury.”

Mr. Somerville's orchard is situated on a gentle northern exposure; soil, rich clay loam, and is surrounded by evergreens, wind breaks and natural groves.

This closes the reports received on Fruit Prospects in Spring of 1885.

It should be stated that the article from Red River Valley (page 296), was written by Mr. R. M. Probstfield, of Moorhead.

STRAWBERRIES.*

[*From Farm and Garden.*]

The strawberry is more uniformly successful in all soils than any other fruit. It appears more at home, provided manure and moisture are present, than any plant we cultivate. The strawberry will do very well in wet land, if it is cultivated

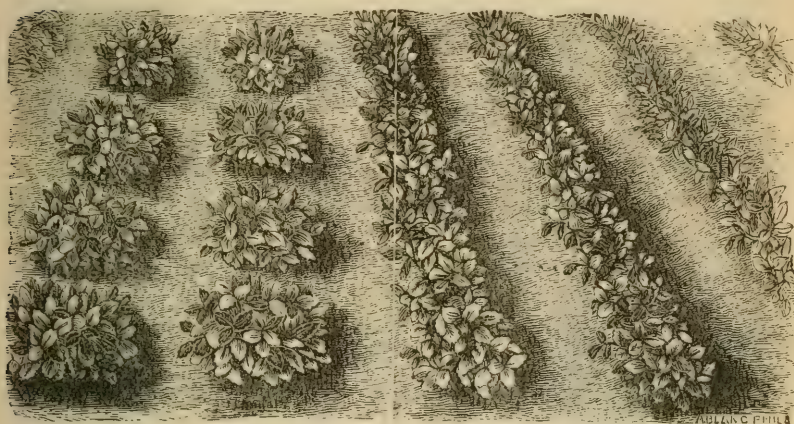


FIGURE 1.—MATTED ROW AND HILL SYSTEM.

in narrow beds with furrows deep enough to hold the standing water. The crowns of the plant must be kept above standing water, or the plant will drown out. With narrow bed culture, wet lands will produce fine berries. Even shifting sands will, with proper culture, yield rich returns of excellent fruit. The best soil is one moderately moist (not wet) and friable enough to allow the berries to root easily, for no plant loves a well cultivated and friable soil as much as the strawberry. A noted strawberry grower says a soil that will produce good timothy will produce good berries. So it undoubtedly will, and so will lands too light in character to grow timothy or other grasses.

PREPARATION OF SOIL.

Much labor may be saved in cultivation by selecting land that has been long in cultivation; land, where all seeds of red and

* Through the courtesy of Col. J. H. Stevens of *Farm, Stock and Home*, we are permitted to use the cuts for illustrations given. —SEC.

white clover, green and blue grass, and perennial grasses have been eradicated. These grasses we mention are very troublesome to destroy. They will take root after the tending of the berries is finished, grow a great height before the berries ripen, and will seriously injure the crop. They cannot be removed until after the picking, and then they have grown to such a height, and are matted so thoroughly, that their removal is very difficult. For this reason we mention the previous preparation of soil. The thorough eradication of these grasses is desirable. Care should also be used not to apply any manure or mulch that contains foul seeds of clover or grasses. Barn-yard manures should be composted with potash salts before using, which will, if properly applied, destroy all the seeds in the compost, and be useful as a fertilizer also.

BOTANY OF THE STRAWBERRY.

It may not be known to some of our readers that all plants are bisexual, except a few plants called Cryptogams. Most plants are perfect, or that is, plants that have both stamens and pistils perfect in all the flowers. The Wilson and Sharpless are of this class, and are hermaphrodite, or perfect-flowering, while in the Manchester, Crescent, and others, the stamens are abortive or wanting, and such



FIGURE 2.

berries are called pistillate berries. The pistils are the female parts of the flower; they spring from the seed the berry, one from each seed, are about a line in length, and are found in the centre of the flower. Figure 2 gives a flower where there are only pistils present. Figure 3 shows the same flower cut in sections. Such flowers as those of pistillate berries, like the Manchester, Crescent, and others, will not bear fruit unless a staminate plant, as the Wilson or Sharpless, is planted near to fertilize them. This is done by the stamens of the flowers which are shown in Figure 4, and in cross-section of Figure 5, where the stamens are seen in an outward circle around the pistils in the centre of the flower. These stamens produce a kind of yellow dust, called pollen, and when a bee, or other insect in search of honey, crawls over the flower, some of the pollen clings to the bee, and is lodged on the pistils of the flower. The flower is then per-



FIGURE 3.

fect. A portion of the pollen which still adheres to the bee, is carried to those plants which are deficient in stamens, and hence, also in pollen, when at once the same fertilization takes place as it did in the former case. The reader will see, were it not for the bee and the stamens of the perfect blossoms of the staminate berries, the pistillate berries would be barren, and would not produce under any circumstances. Such varieties often fail to produce fair berries for want



FIGURE 4.

of a sufficient number of perfect flowering varieties near them. When they are planted four to one, the fertilization will be complete, and an abundant crop of perfect berries will be produced. The question will be asked, "why plant pistillate kinds at all?" We answer, "many of the pistillate berries are the most productive and valuable varieties when properly fertilized, and are among the most profitable."

THE EFFECTS OF CROSS-FERTILIZATION.

The *Farm and Garden* was the first agricultural paper to give prominence to the important effects of cross-fertilization of strawberries. In January, 1884, our gifted contributor, Mr. J. T. Lovett, first brought the subject prominently to the notice of the horticultural public. The subject is now of much interest to all fruit growers. Mr. Fuller, some years ago, alluded to the fact that there was a variation of berries where there was a cross-fertilization, but it remained for Mr. Lovett to fully demonstrate the influence of varieties on each other when planted together, as he did fully, first in the *Farm and Garden* of last year. Many deny there is any influence at all exerted by pollenization, and it was a fertile subject of discussion at the recent meeting of the Mississippi Valley Horticultural Society at New Orleans. Wm. Parry, of Parry, N. J., claims he has observed the effects of cross-fertilization fully marked in pears, and many others claim the same of other fruits. There are also very many who deny any such effects, and attribute all the changes noticed to difference in cultivation. We find, by intercourse with many practical strawberry growers, and from reports of the various horticultural societies we re-



FIGURE 5.

ceive, that the fact appears to be well established that changes do occur by cross-fertilization, that fully affect the size, flavor, and general character of the fruit. The reader will read elsewhere in this paper the difference in the sexual organs of the strawberry, and that while some are perfect flowering, like the Wilson, Hovey, and others, yet there is a large class which need, like the Crescent, Manchester, and many more, to be planted near the others, or they will fail to produce perfect berries, or entirely fail to produce at all. The Wilson will, as fertilizer, with pistillate varieties, make a firm berry and will carry well. Let the Sharpless be used, and a larger berry will be produced by the cross, but at the expense of the firmness. A well-known grower of strawberries showed us some rows of the Manchester, in which every fourth plant was a Sharpless, and informed us that the Manchester was so changed by the Sharpless in its size, shape, and color, that they were all picked and sold together for Sharpless, and were to all appearance Sharpless. He had all the bearing qualities of the Manchester combined with size, color, and shape of the Sharpless. Director Lazenby, of Ohio Experimental Station, in experiments with cross-fertilization, has found in every instance a marked resemblance in shape, size, color, and general appearance to the fruit of the male parent. So strongly was this marked that he states that the cross-bred berries bore no resemblance to the female parent. Crescents were fertilized with four different varieties—Cumberland, James Vick, Charles Downing, and Sharpless. Fertilized by the Cumberland, the berries were light in color and soft; with the Vick, small but firm; with the Downing, they were similar to the Downing, with the characteristic gloss of that berry; with the Sharpless, they were large, like the Sharpless, and irregular. He also experimented with the Manchester, with the same results as with the Crescent.

T. T. Lyon, of Van Buren, Michigan, in a letter to the *Rural New Yorker*, disclaims belief in any marked degree of effect in pollenization, and says that the Crescent remains, with him, the same soft, insipid berry, whether fertilized by the Wilson, Bidwell, Sharpless, or Miner, and says the same of other varieties he has tested in cross-fertilization. He claims soil and cultivation will account for the changes supposed to be produced by cross-fertilization. There is a possibility that Mr. Lyon may be misled, from the fact, as observed by Mr. J. B. Rogers, of Milburn, N. J., that some of the pistillate berries, in rich soils, be-

come fertile and self-fertilizing, and such may be the case with Mr. Lyon, and his berries may not be cross-bred at all. So far, it appears to us, the proof that cross-fertilization does affect strawberries, as asserted, seems to rest on a good foundation, and will be advisable for our readers to make a note of it.

FERTILIZERS.

The strawberry wants two things in abundance, *manure* and *water*. The ground cannot be made too rich and productive. Potash and phosphate, especially potash, are specific manures for strawberries. They never seem to know when they get enough of them. Barn-yard and stable manures contain them all, and can safely be used in any quantity. The more you use of them the more the profit; the last load in all cases paying better than the preceding one. Where there is a scarcity of stable and barn-yard manures, ashes and the various potash salts are next in value when applied with bone-dust. The high grade sulphate—eighty per cent—we like best, then the muriate, and the common form of kainit.

The proper time for application is, when used largely, before the plants are set. One ton per acre of potash salts and one of bone-dust will be found useful. The bone-dust can be sown broadcast, after setting the berries, but before is preferable. The use of potash fertilizers, after setting, must be in small quantities—say two or three hundred pounds per acre, and after each rain again applied. By this manner of applying the potash salts all danger of burning the plants by them will be avoided. Gypsum will make the berries of a lighter color, but will not affect the firmness. Where a rapid growth of the berry is desired, the application of two hundred pounds of nitrate of soda per acre, before a rain, a week or two previous to ripening, will greatly increase the size of the berries, but at the expense of firmness. Varieties that have large leaves, like the Sharpless and Kentucky, will be greatly increased in foliage and will ripen poorly, while those of moderate sized leaves, like the Wilson, will be benefited by it. The leaves will be so increased in size that the berries will be better shaded. The nitrate of soda also is valuable in dry weather. Plants fertilized with it will stand dry weather better. Use manure freely for great profits in berry culture.

IRRIGATION.

The question of irrigation is each year commanding more attention among practical strawberry growers. The great value of moisture to the crop, and the uncertainty of rains at the period of ripening, the most precarious period of successful berry culture, has led to an extended discussion upon the merits of irrigation as a means to supply moisture in field culture. As yet no

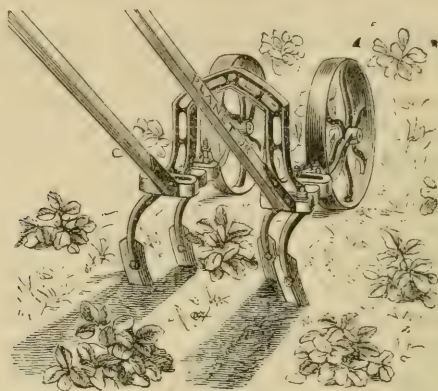


FIGURE 6.

experiments have taken place that will fully decide if irrigation pays, by an increased yield of the crop. No one doubts the value of irrigation, the cost is the only question to be decided. The most successful plan so far has been the laying of drain tiles a foot deep under the row before setting the plants, and when the irrigation is needed, filling the tiles with water and allowing the water to saturate the soil. This plan has been found to be the best of *all plans* so far tried. The water does not harden the soil as when applied by surface watering. We shall watch with interest trials that are made to test the water. A very successful plan of irrigation for garden culture is that of setting near the berry plants ordinary earthen flower pots, even with the soil, and on approach of dry weather filling them daily with water. Those who try it will be delighted with the largest and most delicious of berries.

HILL CULTURE.

Hill culture would be more practiced in berry growing were it not for the trouble of keeping the runners from taking root,

thus making the matted row, and also the use of the hoe being more necessary. We give a cut of a very excellent plan of setting berries by the hill system, and an easy plan of cultivation, whereby the use of the hoe is almost entirely avoided. The plants are set in rows, eighteen inches between them, and the same distance apart in the rows. Then a space of three feet left for horse cultivation, and three rows of hills planted as before. These hills range crossways as well as in the row. The cultivation is easy. The three foot space is thoroughly pulverized by the horse cultivator and crossways by the use of the Planet, Jr., wheel hoe, the use of which is plainly shown in the cut. When hoed crossways, the cultivation is continued by going the other way and all the soil will be loosened, weeds and grass exterminated, and the labor of hill culture will be greatly reduced. The ground should be cultivated by the wheel hoe after each rain. The weeds and grass are more easily killed by frequently stirring the soil, than by destroying it after it has become well established. After the berries have fruited, the space between the hills is well culti



FIGURE 7.

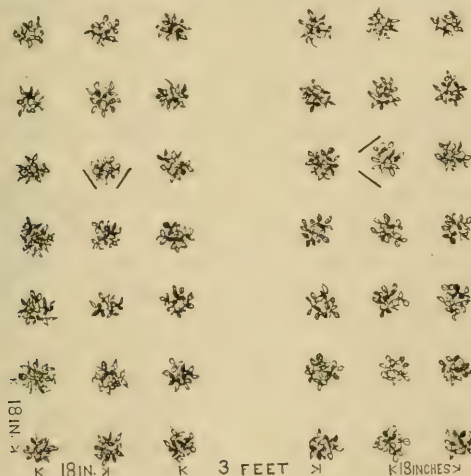


FIGURE 8.

vated and manured, and the runners may be allowed to grow. They will soon fill the space and make a matted row for the next season's crop. We prefer, however, annual renewal. The runners are easily reduced by the use of a circular cutter, an illus-

tration of which we give. The cutter is made of a cast steel ring, a foot or so in diameter and very sharp. A single thrust over the hill will cut off all runners in a rapid and successful manner. With the aid of the wheel hoe and runner cutter, the labor in hill culture is greatly reduced. We give in Figure 1 a good illustration of the berry in both hill and matted row systems of culture. It conveys clearly the two plans.

TRANSPLANTING.

Always secure young, vigorous plants of the varieties you wish, for transplanting. Old plants—those that have set fruit—are not good for this purpose. They may be recognized by the black roots that adhere to them, and if these are used, the old roots should be broken off, with the black stem to which they are attached.



FIGURE 9.

Young plants may be known by their fresh-looking appearance and the mass of long, white roots, free from black ones, and are the only ones fit for setting. The dead leaves, if any, are also removed, and if the weather be dry, allow but a few of the green leaves to remain. The leaves will soon grow, while if many are left the plant may be exhausted of all its vitality and perish. The best season for planting in field culture is in May, or earlier, if weather permits, for the plants become then fully rooted for a large crop the coming year. In transplanting, spread the roots out even with the surface, as shown in figure 9, not too deep, as in figure 11, or too shallow, as in figure 12. The cuts are so well done, that the idea of setting is fully illustrated.

Young plants may be known by their fresh-looking appearance and the mass of long, white roots, free from black ones, and are the only ones fit for setting.

The dead leaves, if any, are also removed, and if the weather be dry, allow but a few of the green leaves to remain. The leaves



FIGURE 10.

MULCHING.

The great use of mulching berries is not only to keep the weeds from growing, but also to keep the ground from exposure to the hot sun and drying winds. The mulch, by its gradual decay, also furnishes manure for the soil. The mulching should not be

done before a hard freeze in the fall or early winter. Freezing will arrest the growth of the plants, and they can then be covered with the mulch without danger of smothering them, as a more early mulching might do.



FIGURE 11.

The best material for mulch is fine hay or fine-cut straw, and chaff that falls behind the machine in threshing. All that is required is fineness of the straw or hay. Long straw cannot be spread evenly, and it cannot be removed from the row in spring when the plants are starting into growth. The thickness of the mulch depends upon the material and the climate. When the mulch is fine and the winter mild, from four to six ordinary loads, per acre, are sufficient for a covering an inch or two thick. When the mulch is coarse and the winter severe, from four to five inches are used. In spring the mulch must be carefully removed from the crowns of the berry plant, or it will smother them. Mulching always pays well. It makes larger berries, keeps them free from sand and dirt, and by making them later in bloom, lessens the danger of injury by late frosts. Many Western growers, after the crop of berries is gathered, set fire to the mulch to kill the insects injurious to the fruit.

PICKING AND MARKETING.

Berries carry, keep fresh longer, and of course sell better, when a portion of the stem is left on when picked. This is done by pinching off the stem above the berry, with the thumb and finger nail, taking care not to bruise the fruit. Pulling or stripping the berries from the plants will lessen the market value and when very carelessly done, the berries are valueless for shipment. Berries carry better when picked in the cool of the morning, and allowed to stand open to the air in the shade. Picked in a hot sun, and at once put in a tight box, out of the wind and air, will cause speedy softening and decay. Always ship berries in a well ventilated car. Ventilation will always keep the fruit in good condition. It is needless to say, make your berries good for good prices. The crates for shipping should be as light and have as much spring as possible. The boxes must be packed closely in the crates to prevent shak-



FIGURE 12.

ing or moving. Berries well picked and well shipped, are half marketed. Never lose sight of the market for berries.

VARIETIES.

We will not take up the subject of varieties. Our country is so large, the climate so varied, the number of varieties so great, and the wants and tastes of people so different, that we could not recommend a list that would suit all who would grow berries. We are often amused to hear berry growers, who plant largely, in the same vicinity, differ widely as to the varieties that suit the neighborhood in which they are located. "When doctors differ, who shall decide?" All we can do is, from time to time, to figure and accurately describe all berries, as they appear to us. The selections must be to the taste and wants of the grower. The suitability of any berry can only be correctly found by trial on the grounds of the person who wishes to grow the best fruit. No theory will be of use. Practical experiments only will decide it to the satisfaction of the grower.

IN MEMORIAM.**HENRY CARROLL STEARNS.**

Henry Carroll Stearns, L. L. B., was born May 11, 1851, in Walpole, New Hampshire. Died Aug. 15, 1884, in Lakeland, Washington County, Minnesota.

The subject of this memoir was the only remaining child of Josiah W. and Abbie Martin Stearns, recently of Watseka, Illinois, but originally of Walpole, New Hampshire. The family name is old and honored in the town of Walpole, dating back in its ancestry to 1630, when Isaac Stearns landed at Boston as one of the passengers of the ship *Arabella*, from England.

Henry C., was a lawyer of much promise in the county of Iroquois, State of Illinois, where he practiced his profession for about six years previous to his coming to this State, being a graduate of the Union College of Law in Chicago, 1876, and admitted to the bar of the Supreme Court of Illinois, the same year. He established a practice in the city of Watseka, the county seat of Iroquois County, where he was highly esteemed by the bench and bar, and by the community generally, until the season of 1882, when his condition of failing health induced him to seek a climate with a dryer atmosphere and having a dryer soil. The State of Minnesota seemed to fill the requirements, and his purpose was to establish himself at Minneapolis; but being too ill to engage in business, he was induced to accompany his devoted parents to the bluffs near Lakeland, where it was hoped the healthful occupation of farming and gardening, under favorable circumstances, would soon result in the restoration of his health.

These hopes, however, proved delusive, as the flatteries of consumption usually do, and after a few months of heroic struggle with this old and most formidable foe, in which he exhibited the highest qualities of patience, fortitude and courage, his attenuated form and panting breath yielded to the inevitable, and the ambitious young lawyer, the affectionate son of doting parents, sleeps in death.

Mr. Stearns possessed, in an eminent degree, those admirable qualities and habits which give assurance of success in an honorable career. Numerous certificates from professional brethren and others with whom he was associated speak in generous and

confident terms of their high hopes and expectations concerning him.

Says his law partner: "I found him to be well acquainted with intricate legal questions, diligent and able. Possessing these essentials of success, he won, and deserved it too, a high rank and an enviable standing with the bench and bar of this district. His determination to leave us is a matter of much regret. As a public speaker, Mr. Stearns is logical and eloquent; as an associate, he is agreeable and courteous."

Weary and worn, go
Rest thee, Stranger, Brother,
Thou art bereft, it may be,
Of a few years of culture
And of fruitage here,
By the swiftness of slow disease;
But thy harvests of well doing
Whilst thou didst stay,
Nor kings, nor thieves can take away.

"When all the things thou calledst thine—
Goods, health, pleasures, honors fall,
Thou in thy virtues shalt survive them all."
And the others, too, shall yet be garnered there,
By One whose tender thought hath numbered every hair.

RICHARD PORTER.

Richard Porter was born at Vermilion, Ashland County, Ohio, June 16, 1825, and at the age of 21 took up his residence at Decatur, Indiana. Ten years later, and on the thirtieth day of May, 1856, he arrived at Rochester, Minnesota, making that city his home till the day of his death, which occurred Jan. 15, 1885, near Huron, D. T., where, together with his son, he was trying to perfect a title to a piece of government land.

The desire to perpetuate the memory of departed friends manifests itself in various ways. Perhaps the use of the marble slab is the most common; but a tree is a monument, and the most fitting one for our friend, who was always so *much* at home among trees, fruits, and flowers. "How living and lasting an epitaph is a grove of trees planted by some early pioneer." In 1884 Mr. Porter was vice-president of the Olmsted County Horticultural Society, and delegate from that to our State Horticultural Society, where he took an active part in everything per-

taining to the welfare of the society or for the promotion of the cause of horticulture in our State.

SKETCH OF HON. CHARLES DOWNING.

The following biographical sketch of the life of Hon. Charles Downing, by S. B. Parsons, is taken from the *Rural New Yorker* of Aug. 16, 1879. It shows in few words the high estimation placed upon his character at the time those lines were written.—SEC.

“Born in 1802, and, working with his father among trees and flowers until twenty years of age, he then succeeded him, and commenced that series of experiments with fruits which makes him now the most trustworthy pomologist of America. From 1836 to 1838 he was in partnership with his brother, who afterwards commenced his literary work, and filled the niche which was then open. A. J. Downing held a spirited and graphic pen, and his breezy articles, when editor of the *Horticulturist*, were the natural outgrowth of his taste and love for horticulture. In the preparation of his book of fruits, however, he was much indebted to his brother Charles, whose long experience gave him accurate knowledge, and who had fruited and compared many thousand varieties. After the death of A. J. Downing this book passed through several editions, each greatly enlarged by Chas. Downing, until the present edition is the best pomological book in the world, and made so mainly by the labors of the subject of this sketch. It was not until after 1840 that I knew either of them; and while admiring the striking qualities of his brother, I was always impressed with the quiet observation, the great accuracy, and the unobtrusive modesty of Charles Downing. He never sought appreciation, but always received it from those who truly knew him. While writing of his attention to fruits I should not forget his love for ornamental plants, and his knowledge of them. His old place was much changed in 1868 by the running of streets and the destruction of many of his trees. He still indulges his taste, however, and his memory does not fail him. Anyone desiring information on fruits can rely upon its correctness if received from Charles Downing. When thinking of the usefulness of such a life one cannot help wishing for the old days of Methuselah when mans’ life was not limited to four score years.

“In the career of the two brothers is a valuable lesson. One gave his life to save life; the other spent his years in labor for men. Sacrifice and labor are two pivots on which the moral world revolves. Happy is the man who has his share of each.”

TREE CULTURE.*

BY DR. RENGGLY, OF LA CROSSE.

*Forests and Their Relation to Climate — Hydrography, Agriculture and Horticulture.**Mr. President, Ladies and Gentlemen:*

All of us are very well aware that the extensive territory of the United States of America is the most recently cultivated country. Only a few centuries ago the same was a wilderness in its entire circuit. In almost immeasurably extensive dimensions, more particularly in the hilly and mountainous regions, all the land was covered with luxuriant forests, whose origin, growth and temporary partial decline was left to nature and its unrestrained activity. Tranquil waters in the shape of large and small lakes, and flowing waters in the form of springs and large and small rivers, passed through the country from and in all directions. This mass of water and its flow was at that time nearly symmetrical. Expansive, treeless prairies made their appearance with surprising rapidity, similar to the small and large deserts of Africa, with this remarkable difference, however, that instead of being sandy, dry and bare of vegetation, they present, in combination with a soil enriched largely with humus, a growth of grass marvelously luxuriant, and a lower strata of soil abounding in water. This latter peculiarity caused the soil to become marshy to a more or less extent. These level prairies, existing in unbounded expansion, are chiefly located in the central regions of this vast territory; no hills, mountains or trees are visible, and furious hurricanes visiting these deserts periodically exercise their absolute authority; by reason of which state of things a prosperous growth of trees appears to be absolutely impossible. In those districts of the country which are covered with a more or less dense growth of timber and where an abundance of water exists, a damp and rugged climate prevails, the same as everywhere else on the surface of the earth. The climate of our country must have been, during the time of its wilderness, in a large measure a damp and inhospitable one. The country was nevertheless at that time abundantly provided with animals of different species. Multitudes of fish and ani-

*This article, procured from the author by Mr. J. S. Harris, to be read at the Annual Meeting, was not presented for lack of time.—SEC.

imals of other species were to be found in lakes and rivers, the forests and open prairies harbored countless numbers of game, and the shrubs and trees furnished a vast amount of nutritious fruit. Everything necessary for the sustenance of a frugal human being, in the form of food, clothing and habitation, was, in a strict sense of the word, at that time attainable with comparatively little effort.

The aborigines of the country, the same as we signify to-day by the name of "Indians," were, at that time, the legal owners and rulers of this vast wilderness and its rich treasure; they were in possession of a paradise, in which these people enjoyed a happy life, full of contentment; the wild nature of the country closely resembling their primitive life, similar to that of the first pair of human beings in the garden of Eden. Like the angel sent by God, after the fall of man, armed with a sword for the purpose of driving Adam and Eve out of paradise, came the civilizing people from Europe into the American wilderness. The axe and the fire destroyed, in an astonishingly short space of time, the luxuriant forests and grassy prairies to an immense extent. Agricultural machines of various kinds, and trained domestic animals, aided the diligent hands and the intelligence of man, in the cultivation of the soil and in his aim at agricultural success. In place of the former wilderness appeared farms and plantations with luxuriant and remunerative cultivation, flourishing gardens and profitable stocks of cattle. Side by side with agriculture and horticulture and in the same proportion, industries and commerce began to flourish, and means of communication and ways of transportation were established. Population increased steadily, and the formation of new and well organized states resulted in comparatively short periods. The number of population increased from a few hundred thousand to fifty millions in a comparatively short space of time. All nations of Europe and many countries of Africa and Asia, all religious sects and all languages have contributed representatives, who live in peace, have friendly intercourse with each other, follow their separate vocations undisturbed, and have good cause to be contented and happy. No country on the globe shows in the course of its history a similar development of its society, agriculture, industry and commerce to the United States of America.

The conditions and motives causing this development and guaranteeing its thriving progress in the future, find their sure source of support in the here ruling freedom; in the protection,

by the state, of personal liberty, in the free and independent pursuit of personal and co-operative industry, regulated by wise laws. A high degree of intelligence, of scientific and practical education, and restless activity of the leading portion of the population, combined with the natural impulse of the whole people to build up a great, independent and mighty nation, led those institutions, laid down and guaranteed in the fundamental constitution of the country, into the track of a marvelously successful development.

The immigration from the other side of the ocean continues constantly and in great numbers, even promises to assume larger dimensions in the future. Hundreds and hundreds of thousands of persons, wishing to evade the dominant circumstances on the other side, and to take part in the blissful institutions of this country, are flocking to our shores. They are eager to take part in the common and paying activity for the development of its rich treasures, and the use of them for their own benefit and for the welfare of the whole people.

Similar to the high, rising stream overflowing its banks in quiet but rapid course, spreading over the territory adjoining, supplying the soil with fertilizing material, the great stream of immigration is spreading over the southern, but more particularly over the northern and western regions of the country, to transform the wilderness into cultivated fields. A comparatively small portion of immigrants remain, either temporary or permanent residents, in the older states of this country.

Simultaneously with the rapid increase of our population and its wonderful distribution over every section of the continent, with the consequent marvelous increase in the production of the prime necessities of life, it is highly important that we should take heed to the preservation of our forests where still left in their primitive grandeur, and cultivate them where destroyed by the hand of Nature or man. Every person noticing the difference in the appearance of the territory of the United States, between the seventeenth century and the present time, must be favorably impressed with the surprising development made during that time. Not only the development of this immense territory, as stated hereinbefore, its increase to its present grandeur, in so wonderfully short a space of time, but the change of the climate of the country is also very surprising. In the same ratio as the destruction of a large portion of the forests and the cultivation of the soil has progressed the climate has become milder

in general. Anything pertaining to the whole United States is also applicable to the State of Minnesota.

It would certainly be a great mistake to take it for granted that the climate as well as the financial condition of the country would be benefited by an increasing removal of the forests, and the utilization of the soil on which they were growing for horticulture and agriculture. On the contrary, and this should never be lost sight of, a climate as good as possible, and the utmost prosperity in agriculture and horticulture, can only be expected to be prevalent in a country where a reasonable proportion of open plains and extensive forests exist, may the same be large or small. A large number of species of animals find a home in these forests; they furnish many useful products and form landscapes exceedingly beautiful to the eye; they are rich sources from which to obtain various kinds of wood, which are absolutely necessary for the maintenance and promotion of our civilization; they also form valuable reservoirs for the precipitations of the atmosphere. During the time of these precipitations, and a long time afterwards, these extensive forests check the immediate drain of the water so received, and discharge the same only by degrees, partly through the medium of springs, into the rivers and lakes, partly through evaporation into the air. In proportion to the degree of the temperature and the amount of water contained in the air, a larger or smaller amount of water is obtained through evaporation, which has a tendency to moderate the excessive heat of the summer season, and guarantees the plants refreshing dew and rain. Forests are also capable of resisting hurricanes. Currents of air, coursing along in furious career, whenever they encounter forests in their rapid course, are considerably moderated, so that they pass afterward over the open country with greatly diminished force. A roaring, rushing, whistling or yelling noise is observed in these forests during the tremendous attack of the tempest; trees are bending, inclining and wavering, and their branches are cracking. The forest is defending itself against the fury of the hurricane with great success. The success of its resistance is proportionately greater where bluffs or chains of mountains support the same.

It is no doubt true that cognizance of the great value of forests, more particularly the great value of the preservation of a most favorable proportion of the same with the open country, with a view to regulation of the climate and the water courses as well as in regard to their influence on agriculture and horticulture.

and also in view of a prosperous condition of the finances of the country generally, is very limited with the people in general, as well in the upper as in the lower strata of society.

Take it in general and you will find that the tendency is still prevailing to extirpate the forests more and more, and establish farms in their place, or to enlarge farms already established. This tendency is prevailing, not only in places where the nature of the soil is favorable, but also in places where the soil is very unfavorable for the establishment of farms. The forests are annihilated, not only on the plains, but also on the level ridges, for the purpose of establishing or enlarging farms. Even on steep ridges and in ravines of the bluffs, the axe and the fire are instrumental to divest the land of their luxuriant growth of trees to a great extent.

The method, adopted during the latter years, to decimate the woods along the slopes of the bluffs by the use of the axe, the fire or grazing cattle, break up the soil and place the same under agriculture, has created an entirely new, but in the highest degree ruinous, system of water courses. No wonder that failure of crops, injury to cultivation and to the stock of cattle, follow the pernicious influence of the same, when, after every violent shower of rain, the dams, built mostly or exclusively of earth, are demolished, the bridges carried off, and the roads left in such a miserable condition that they are impassable. This great calamity is at this time predominant in the bluff regions. The in the highest degree important question, how the same may be diminished, or even excluded, is certainly not an untimely one. We will try to answer the same in a few short passages:

First — Leave off entirely to set the prairie on fire.

Second — The cattle must be excluded from the growing, or commenced to be growing, underwood.

Third — Leave the steep declivities of the bluffs, such as are absolutely unpropitious for agriculture, to the unlimited activity of Nature, and in places where Nature acts insufficiently for the growth of timber, it would be well to help her by planting young trees, shrubs, etc.

Fourth — The land located on the slopes of the bluffs, and already cultivated, which may be used for other purposes than the growth of timber, should be seeded down with grass plants, such as are hardy and useful for feeding cattle. In such soil of our bluff territory, which contains lime in profusion, the planting of esparcet (*Hedysarum onobrychis*) would be most excellent; the

same endures our climate sufficiently, and renders, when cut and dried at the time of its bloom, a large quantity of superior fodder for cattle.

FRUIT AT SOUTHERN MINNESOTA FAIR.

From Rochester Record and Union.

The fruit show at the Southern Minnesota fair last week was the finest ever seen in this city, and considering the quality has never been approached in the State; and the man who twenty years ago would have predicted such a show possible would have been deemed demented. Two prominent features in this exhibition were the absence of large collections, and the fact that there was no fruit on the shelves for mere effect. With the exception of about a dozen plates, all were entered for competition, and with the exception of three professionals, all were the exhibits of farmers, of just such fruit as they had plenty more of at home. The specimens were in many instances so uniformly fine that the committee found great difficulty in making awards, especially the committee on plates, who consumed more than one entire day in their labors, completing their duties to the entire satisfaction, so far as we have been able to learn, of all the exhibitors. There were brought out at this fair, for the first time, a number of promising Minnesota seedlings, and the commissioner to the New Orleans Exposition found among them, as well as the older sorts, many things worthy of notice, and empowered Mr. A. W. Sias to make and forward a collection for exhibition at that place, and also expressed a strong desire to have a photograph of this exhibit forwarded with that collection, to show to the world what a single locality can do in the way of supplying the people with such a desirable fruit as the apple. The tempting display made by Pomona on this occasion will long linger in the memory of those who were so fortunate as to witness it, and will go far to dispel all doubts as to the future of horticulture in Minnesota.

THE LAW RELATING TO THE PRINTING AND DISTRIBUTION OF THE HORTICULTURAL REPORTS.

CHAPTER 8, GENERAL LAWS OF 1883.

AN ACT TO AMEND CHAPTER SEVENTY-TWO (72) OF THE GENERAL LAWS OF ONE THOUSAND EIGHT HUNDRED AND EIGHTY-ONE (1881), RELATING TO THE STATE HORTICULTURAL SOCIETY.

Be it enacted by the Legislature of the State of Minnesota :

SECTION 1. Sections one (1) and two (2) of chapter seventy-two (72) of the General Laws of one thousand eight hundred and eighty-one (1881) relating to the State Horticultural Society shall be amended so as to read as follows:

SEC. 1. There shall be annually printed and bound thirty-five hundred (3,500) copies of the annual report of the State Horticultural Society, provided the number of printed pages of the same shall not exceed five hundred (500); which report shall be transmitted to the governor, and shall be distributed by the State Horticultural Society, as follows:

One (1) copy to each of the State officers, members of the legislature, judges and clerks of the supreme and district courts, county auditors and members of the board of regents and faculty of the State University; fifty (50) copies to the State Historical Society; one hundred (100) copies to the State Board of Immigration; one hundred (100) copies to the State Agricultural Society in exchange for a like number of its annual reports; and a sufficient number of copies to each county horticultural society to supply one copy to each of its members; provided, such county society shall be in active existence, and shall have filed with the secretary of the State Horticultural Society a list of its officers and committees, and an abstract of its proceedings for the year preceding; and the remaining copies shall be distributed by the State Horticultural Society, in such manner as it shall deem best, after retaining a sufficient number for its library and to supply future members and exchanges.

SEC. 2. This act shall take effect and be in force from and after its passage.

Approved February 28, 1883.

THE LAW OF MINNESOTA ON FRUIT STEALING.

Chapter 35, General Laws 1867.

AN ACT FOR THE PROTECTION OF FRUIT AND ORNAMENTAL TREES, SHRUBS, VINES, AND VEGETABLE PRODUCTIONS.

Be it enacted by the Legislature of the State of Minnesota :

SECTION 1. That if any person or persons in this State shall hereafter enter the enclosure of any person, without the leave or license of such owner, and pick, destroy, or carry away the fruit, or any portion thereof, of any apple, pear, peach, plum, grape, or other fruit tree, bush, or vine, or any vegetable products, such person shall be deemed guilty of a misdemeanor, and upon conviction thereof may be fined any sum not less than ten nor more than fifty dollars, and imprisoned in the county jail for any period not exceeding thirty days.

SEC. 2. That if any person or persons in this State shall willfully and maliciously, and without lawful authority, cut down, root up, sever, injure, peel, destroy or carry away, any fruit or ornamental tree, or shrub, cultivated root, plant, or vine, of whatever kind, or any fruit or other vegetable production, standing, or growing on, or being attached to the land of another, or shall willfully, and without lawful authority, cut down, root up, destroy or injure, in any manner, or carry away any fruit or ornamental tree, plant, shrub, or vine, upon any street, lane, alley, public highway, or public grounds, in any city, town, or village in this State, such person or persons so offending shall be deemed guilty of a misdemeanor, and upon conviction thereof, shall be punished by a fine of not more than five hundred dollars, or by imprisonment in the county jail not exceeding three months, or both fine and imprisonment, at the discretion of the court having jurisdiction of the case, and shall, moreover, be liable in double the amount of damages to the party injured.

SEC. 3. The penalties incurred by violation of this act may be enforced by indictment in any court having jurisdiction of misdemeanors in the county where the offense is committed, or the fine may be recovered in an action for debt before any justice of the peace of such county.

SEC. 4. This act shall take effect and be in force from and after its passage.

Approved March 9, 1867.

ADDITIONAL ANNUAL MEMBERS, 1885.

A. E. Gipson.....	Greeley, Colorado.
C. H. Hoffner	Litchfield.
Seth H. Kenney	Morristown
L. D. Mills	Garden City.
A. Norby	Madison, Dakota.
C. T. Palmer	Minneapolis.

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ANNUAL REPORT

—OF THE—

MINNESOTA STATE

HORTICULTURAL SOCIETY

FOR THE YEAR 1886,

EMBRACING THE

TRANSACTIONS OF THE SOCIETY, FROM MARCH 31, 1885, TO MARCH
31, 1886, PROCEEDINGS OF ITS ANNUAL AND SEMI-ANNUAL
MEETINGS, ESSAYS, REPORTS, ETC.

VOL. XIV.



PREPARED BY THE SECRETARY, S. D. HILLMAN, MINNEAPOLIS, MINN.

ST. PAUL.
J. W. CUNNINGHAM & CO.
1886.

LETTER OF TRANSMITTAL TO THE GOVERNOR.

OFFICE OF THE SECRETARY, }
MINNEAPOLIS, March 31, 1886. }

To Hon. L. F. Hubbard, Governor of Minnesota:

SIR: I have the honor to submit herewith, in compliance with legal requisition, the accompanying report for 1886, with supplementary papers.

Respectfully yours,
S. D. HILLMAN,
Secretary Minnesota State Horticultural Society.

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OFFICERS AND MEMBERS FOR 1886.

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E. H. S. DARTT.....Owatonna
M. CUTLER.....Sumter
F. G. GOULD.....Excelsior
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S. D. HILLMAN.....Minneapolis

TREASURER.

J. T. GRIMES.....Minneapolis

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M. PEARCE.....Minneapolis

ENTOMOLOGIST.

Prof. O. W. OESTLUND.....Minneapolis

LIBRARIAN.

E. A. CUZNER.....College of Agriculture, Minneapolis

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J. S. HARRIS	La Crescent
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GEORGE S. WOOLSEY.....	Minneapolis
W. H. BRIMHALL.....	St. Paul

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J. C. KRAMER.....	La Crescent
O. E. SAUNDERS.....	Granite Falls
O. F. NORWOOD.....	Balaton, Murray County
M. C. BUNNELL.....	Newport
N. J. STUBBS.....	Long Lake
WILLIAM MCHENRY.....	St. Charles
O. M. LORD.....	Minnesota City
CLARENCE WEDGE.....	Albert Lea
GEORGE E. CASE.....	St. Peter
M. CUTLER.....	Sumter
G. W. FULLER.....	Litchfield
L. E. DAY.....	Farmington
CHARLES LUEDLOFF.....	Carver
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WM. CANNON.....	Fort A. Lincoln, Dak.

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F. J. SCHREIBER.....	Moorhead
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UNDERWOOD & EMERY.....	Lake City
B. TAYLOR.....	Forestville
FRED VON BAUMBACH.....	Alexandria
E. H. S. DARTT.....	Owatonna
L. E. DAY.....	Farmington
J. S. HARRIS	La Crescent
O. M. LORD.....	Minnesota City

The members of the General Fruit Committee are expected to report separately on all matters of interest in Horticulture, but more especially to bring to the notice of the Society new and improved fruits.

ANNUAL MEMBERS, 1886.

ACKERMAN, J. H.	Young America
ALLEN, JOSIAH	Red Wing
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BOST, T.	Excelsior
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BRIMHALL, W. H.	St. Paul
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CORP, SIDNEY	Hammond
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CRANDALL, ETHAN	Sumter
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DARTT, E. H. S.	Owatonna
DAY, DITUS	Farmington

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DUNTON, H. J.....	Clearwater
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ELLSWORTH, H. R.....	Eldora, Iowa
EMERY, S. M.....	Lake City
FORD, J. A.....	Newport
FORSTER, WILLIAM.....	Chatfield
FOWLER, E. P. C.....	Lake City
FULLER, GEORGE W.....	Litchfield
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GIDEON, JOSIAH.....	Excelsior
GILMORE, J. F.....	Richfield
GILPATRICK, ISAAC.....	Minneapolis
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GOULD, MRS. M. S.....	Excelsior
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HARRIS, EUGENE E.....	La Crescent
HARRIS, FRANK I.....	La Crescent
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HIRSCHINGER, CHARLES.....	Baraboo, Wis.
HOAG, M. J.....	Rochester
HOLES, ANDREW.....	Moorhead
HOPKINS, W. J.....	Bloomington
HUNTINGTON, J. C.....	Excelsior
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JENKINS, J. W.....	Champlin
JORDAN, E. B.....	Rochester

KENNEY, SETH H.	Morristown
KENNING, CHARLES	Bird Island
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KNAPHEIDE, RUDOLPH	St. Paul
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LABBITT, H. L.	Eldred, Cass Co., Dak.
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McHENRY, WILLIAM	St. Charles
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OWEN, S. M.	Minneapolis
PALMER, CHARLES T.	Minneapolis
PARKER, W. L.	Farmington
PARTRIDGE, SAM.	Moorehead
PETERSON, ANDREW	Waconia
POOLE, J. W.	Farmington
PORTER, PROF. EDWARD D.	St. Anthony Park
PUFFER, DR. F. L.	Bird Island
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SAUNDERS, MRS. O. E.	Granite Falls
SCHREIBER, F. J.	Moorhead

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SMITH, CALEB.....	Farmington
SMITH, C. L.....	Minneapolis
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TANNER, WILLIAM.....	Cannon Falls
TAYLOR, HON. J. W.....	Winnepeg, Manitoba
UNDERWOOD, J. M.....	Lake City
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VARLEY, CHRIS.....	Big Lake
WARD, C. W.....	Sumter
WEDGE, CLARENCE.....	Albert Lea
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GEORGE J. KELLOGG, from 1882.....	Janesville, Wis.
G. P. PUTNAM, from 1882.....	Ash Ridge, Wis.
EDSON GAYLORD, from 1886.....	Nora Springs, Iowa

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R. J. MENDENHALL.....	Minneapolis
TRUMAN M. SMITH.....	St. Paul
L. M. FORD.....	St. Paul
WYMAN ELLIOT.....	Minneapolis
CHARLES HOAG.....	Minneapolis
J. T. GRIMES.....	Minneapolis
MRS. C. O. VAN CLEVE.....	Minneapolis
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COL. D. A. ROBERTSON.....	St. Paul
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CHAS. LEUDLOFF.....	Carver
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MRS. H. B. SARGEANT.....	Lake City
MISS SARAH MANNING.....	Lake City

OFFICERS

OF THE

MINNESOTA STATE AGRICULTURAL SOCIETY

FOR THE YEAR 1886.

PRESIDENT.

HORACE W. PRATT.....Faribault

VICE-PRESIDENTS.

WM. R. MERRIAM.....St. Paul

FRED C. PILLSBURY.....Minneapolis

SECRETARY.

R. C. JUDSON.....Farmington

TREASURER.

F. J. WILCOX.....Northfield

BOARD OF MANAGERS.

JAS. McHENCH.....Fairmont

J. S. HARRIS.....La Crescent

A. N. JOHNSON.....Benson

CLARK CHAMBERS.....Owatonna

JOHN COOPER.....St. Cloud

JOHN F. NORRISH.....Hastings

The next Annual Fair will be held on the new State Fair Grounds between Minneapolis and St. Paul, Aug. 30 to Sept. 4, 1886. No effort will be spared to make it the best agricultural and horticultural exposition of the year.

Liberal premiums offered in every department.

THE LAW RELATING TO THE PRINTING AND DISTRIBUTION OF THE HORTICULTURAL REPORTS.

CHAPTER 8, GENERAL LAWS OF 1883.

AN ACT TO AMEND CHAPTER SEVENTY-TWO (72) OF THE GENERAL LAWS OF ONE THOUSAND EIGHT HUNDRED AND EIGHTY-ONE (1881) RELATING TO THE STATE HORTICULTURAL SOCIETY.

Be it enacted by the Legislature of the State of Minnesota.

SECTION 1. Sections one (1) and two (2) of chapter seventy-two of the General Laws of one thousand eight hundred and eighty-one (1881) relating to the State Horticultural Society shall be amended so as to read as follows:

SEC. 1. There shall be annually printed and bound thirty-five hundred (3500) copies of the annual report of the State Horticultural Society, provided the number of printed pages of the same shall not exceed five hundred (500); which report shall be transmitted to the governor and shall be distributed by the State Horticultural Society, as follows:

One (1) copy to each of the State officers, members of the legislature, judges and clerks of the supreme and district courts, county auditors and members of the board of regents and faculty of the State University; fifty (50) copies to the State Historical Society; one hundred (100) copies to the State Board of Immigration; one hundred (100) copies to the State Agricultural Society in exchange for a like number of its annual reports; and a sufficient number of copies to each county horticultural society to supply one copy to each of its members; provided, such county society shall be in active existence, and shall have filed with the Secretary of the State Horticultural Society a list of its officers and committees, and an abstract of its proceedings for the year preceding; and the remaining copies shall be distributed by the State Horticultural Society, in such manner as it shall deem best, after retaining a sufficient number for its library and to supply future members and exchanges.

SEC. 2. This act shall take effect and be in force from and after its passage.

Approved February 28, 1883.

CONSTITUTION

OF THE

Minnesota Horticultural Society.

ARTICLE I.

NAME.

This society shall be known as the Minnesota State Horticultural Society.

ARTICLE II.

OBJECT OF THE SOCIETY.

The object of this society shall be to improve the condition of pomology, horticulture and arboriculture, by collecting and disseminating correct information concerning the culture of such fruits, flowers, trees, and other productions in horticulture as are adapted to the soil and climate of Minnesota.

ARTICLE III.

MEMBERSHIP.

Any person may become a member by paying to the Secretary or treasurer an annual fee of one dollar, or a life member by the payment of ten dollars. Honorary members, for a time stated or for life, may be elected at any annual meeting by a two-thirds vote of the society, and shall be entitled to all the rights and privileges of membership.

ARTICLE IV.

OFFICERS.

Its officers shall consist of a president and one vice president from each congressional district, a secretary, treasurer, and an executive committee of five, and a librarian.

ARTICLE V.

DUTIES OF PRESIDENT AND VICE PRESIDENTS.

The President shall preside at and conduct all meetings of the society, and deliver an annual address, and in his absence the Vice Presidents, in their order, shall perform the same duties. They shall also have a general supervision of the horticultural interests in their respective districts, and make a written report to the society at its annual winter meeting; in consideration of which the society shall pay their traveling expenses to the same.

ARTICLE VI.

THE SECRETARY.

The Secretary shall record all the doings of the society, collate and prepare all communications, etc., for the public press, and pay over all moneys received from members or otherwise to the treasurer on his receipt; receive and answer all communications addressed to the secretary, establish and maintain correspondence with all local, county, district and state horticultural societies, and secure by exchange their transactions, as far as possible; to aid the president as an executive officer in the dispatch of business relating to meetings of the society, notices of horticultural and similar meetings of general interest, and report to the annual meeting of the society an abstract of the matter that has come into his possession, which, with its approval, shall become part of its transactions for the current year.

ARTICLE VII.

THE TREASURER.

The Treasurer shall collect and hold all funds of the society, and pay out the same only on the order of the president, countersigned by the secretary. He shall make up a report of all the receipts and disbursements of the society, and present the same at the annual winter

meeting, or at any other time when called upon to do so by the executive committee. He shall give bonds in such sum as the society may direct, to be approved by the president and secretary, and the bond when so approved shall be filed with the state auditor.

ARTICLE VIII.

ELECTION OF OFFICERS.

The officers shall be elected separately and annually by ballot, and hold their office until their successors are elected.

ARTICLE IX.

MEETINGS OF THE SOCIETY.

The society shall hold annual sessions on the third Tuesday of January, and other meetings at such time and place as the society may direct.

ARTICLE X.

THE LIBRARIAN.

The Librarian shall have charge of the library and report its condition at each annual meeting.

ARTICLE XI.

AMENDMENTS.

By-laws and alterations of the constitution, for the purpose of meeting the further wants of the society, may be enacted by a vote of two-thirds of the members present at any regular annual meeting, and on one day's notice of the same being given.

BY-LAWS.

1. The president, at each annual meeting of the society, shall appoint a general fruit committee, consisting of two members from each congressional district in the State, and it shall be the duty of each member to make a written report annually upon the fruit crop, and a limited list of fruits best adapted for general cultivation in their respective districts.

2. The president, secretary and treasurer shall be members *ex officio* of the executive committee, who shall have charge of all matters pertaining to the interests of the society.

3. The executive committee may call a meeting of the society at any time they may deem advisable, giving at least thirty days' notice through the public press.

4. The executive committee shall appoint a committee on seedlings, on nomenclature, on forestry, on fruit blossoms, on Russian apples, on gardening, on small fruits, and on floriculture.

5. The five members of the executive committee, not including the president, secretary or treasurer, shall be a committee on finance, and it shall be their duty to audit all bills before they shall be ordered paid by the president and secretary.

6. The executive committee shall see that a program is issued for each meeting of the society, at least one month before the winter meeting and ten days before the summer meeting.

7. Every member shall be entitled to one copy of the transactions as often as published, on which postage shall be paid; but in the distribution of all other copies the party receiving the same shall pay the postage; where several copies are sent to auxiliary societies it shall be discretionary with the secretary to pay the freight.

8. *Quorum.* A quorum shall consist of nine members of the society, or a majority of the executive committee.

MINNESOTA STATE HORTICULTURAL SOCIETY.

TRANSACTIONS 1885-6.

THE SUMMER MEETING, 1885.

The nineteenth semi-annual summer meeting of the Minnesota State Horticultural Society, in accordance with the action taken by the society at its annual session in January, was held in Minneapolis, at Market Hall, Wednesday and Thursday, June 24 and 25, 1885.

The meeting was held in connection with the Hennepin County Horticultural Society, the attendance throughout the sessions was quite large and the proceedings of more than usual interest. Following are the program, premium list and rules issued in the circulars sent out announcing the meeting:

PROGRAM.

FIRST DAY, WEDNESDAY, JUNE 24.

9:00 to 12:00 M. Making entries, setting up and arranging exhibits.

2:00 P. M. Opening Exercises; appointment of committees.

2:30 P. M. Address of welcome by Prof. E. D. Porter.

Response by President T. M. Smith.

3:00 P. M. Paper on Strawberries by M. Pearce.

Discussion.

5:00 P. M. Paper on Insects by Prof. Wm. Trelease, of Madison, Wis.

SECOND DAY, THURSDAY, JUNE 26.

9:00 A. M. Communications and unfinished business.

9:30 A. M. Paper—Practical suggestions on the Growing of Small Fruits, by C. H. Hamilton, of Ripon, Wis.

10:00 A. M. Paper, by J. L. Budd, Professor of Horticulture, Ames, Iowa.

10:30 A. M. Verbal or written reports on the Fruit Outlook for the Year.

Discussion and Question Box.

11:30 A. M. Report of committees on Awards.

12:00 M. Picnic.

AFTERNOON.

1:30 P. M. Visit to Parks and Horticultural Gardens in and adjacent to Minneapolis.

PREMIUM LIST.

WYMAN ELLIOT, Superintendent of Exhibits.

STRAWBERRIES.

	1st Prem.	2d Prem.
Best general collection of not less than five named varieties, one pint each.....	\$5 00	\$3 00
Best four varieties, one quart each.....	3 00	2 00
Best Minnesota Seedling, not before exhibited..	5 00	3 00
Best three plants in pots.....	2 00	1 00
Best three quarts Wilson's Albany.....	2 00	1 00
Best three quarts Downer's Prolific.....	2 00	1 00
Best three quarts Charles Downing.....	2 00	1 00
Best three quarts Crescent Seedling....	2 00	1 00
Best three quarts James Vick.....	2 00	1 00
Best three quarts Manchester.....	2 00	1 00
Best three quarts Glendale.....	2 00	1 00

STRAWBERRIES—Concluded.

	1st Prem.	2d Prem.
Best three quarts Longfellow.....	\$2 00	\$1 00
Best three quarts Cumberland Triumph.....	2 00	1 00
Best three quarts Minnetonka Chief.....	2 00	1 00
Largest fruit of any variety.....	2 00	1 00

The same premiums may be awarded upon other varieties of equal merit.

Best and neatest 16 or more quart crate.

Best quart boxes.

Best quart baskets.

CURRANTS AND CHERRIES.

Best quart currants, variety named, green or ripe.....	\$2 00	\$1 00
Best quart of cherries, ripe.....	2 00	1 00

RASPBERRIES.

Best collection, not less than three varieties, one pint each.....	\$3 00	\$2 00
Best pint of each variety in separate exhibits...	2 00	1 00

VEGETABLES.

Best collection, not less than six varieties, grown by exhibitor.....	\$5 00	\$3 00
Best 3 bunches of Asparagus	1 00	50
Best 6 Beets	1 00	50
Best 6 Carrots	1 00	50
Best 6 Onions.....	1 00	50
Best 6 Radishes.....	1 00	50
Best 6 Turnips	1 00	50
Best 6 Stalks Pie Plant.....	1 00	50
Best 6 Heads Lettuce	1 00	50
Best 3 Heads of Cabbage	1 00	50
Best 3 Heads of Cauliflower	1 00	50
Best $\frac{1}{2}$ peck Green Peas	1 00	50
Best $\frac{1}{2}$ peck of String Beans.....	1 00	50

VEGETABLES—Concluded.

	1st Prem.	2d Prem.
Best $\frac{1}{2}$ peck of New Potatoes	\$1 00	\$ 50
Best 6 Cucumbers	1 00	50
Best 6 Summer Squash.....	1 00	50
Best $\frac{1}{2}$ bushel of old Potatoes, with statement of method of growing and keeping.....	2 00	1 00

FLOWERS.

Best table design of Cut Flowers.....	\$5 00	\$3 00
Best basket of Cut Flowers.....	2 00	1 00
Best bouquet of Roses.....	2 00	1 00
Best Hand Bouquet.....	2 00	1 00
Best collection of Wild Flowers.....	2 00	1 00
Best collection of Perpetual Roses	2 00	1 00
Best collection of Geraniums	2 00	1 00
Best collection of Pansies	2 00	1 00

RULES.

1. As the object of this meeting is to cultivate a better acquaintance with our horticulturists and encourage the home production of small fruits and early vegetables of the best quality, all exhibitors are requested to place with their exhibits a concise written statement of their methods of treatment, cultivation and soil, exposure, protection and best method of marketing their produce.

2. All fruits should be fully ripe or in best state of maturity for home use or market, and in such a condition that their merits may be fairly reported upon.

3. All vegetables should be shown in the most attractive style for placing on the market.

4. The awarding committee shall close their labor before 10 o'clock A. M., and report to the society at 11 A. M. of the second day of the meeting. Their report shall contain the names and post office address of each contributor to the exhibition, and in each case where prizes are awarded, note the points upon which they predicate their

decisions, and they shall have power to recommend special premiums for seedlings, and articles of especial merit, not provided for in the schedule of premiums.

They shall not award premiums to contributions unworthy of exhibition, even if there is no competition, or where the conditions governing the exhibition have not been complied with.

5. Competition shall be open to all, but the annual membership fee of \$1.00 will be deducted from premiums awarded to persons who are not members of the State Horticultural Society.

6. All entries must be made in the name of the producer, or, in the case of new seedlings, in the name of the present owner of the stock, but the name of the originator, when known, should accompany the entry.



PROCEEDINGS AT THE SUMMER MEETING.

FIRST DAY.

WEDNESDAY, JUNE 24, 1885.

The summer meeting of the State Horticultural Society was held pursuant to notice, and the morning of the first day was devoted to the arrangement of exhibits and making entries. The number of entries made and the quality of fruit exhibited was most gratifying, especially of strawberries, the specimens shown being remarkably large and fine.

EXHIBITORS AND EXHIBITS.

Following is a list of exhibitors and their exhibits:

J. S. Harris, La Crescent, two quarts Sharpless strawberries, two quarts seedlings, and six bunches pie plant.

A. W. Sias, Rochester, one quart Sharpless strawberries, three quarts Cumberland Triumph and two quarts Crescent seedling.

J. C. Kramer, La Crescent seedling strawberries, and Kramer's seedlings, Glendale, Wilson, Crescent and Capt. Jack strawberries, five bunches asparagus and bouquet of wild flowers.

G. H. Roberts, Minneapolis, three quarts each Countess and Sharpless strawberries; one-half peck peas, "first and best;" bouquet roses.

Truman M. Smith, St. Paul, three bunches asparagus, quart Bright Idea strawberries.

F. X. Crepeau, Minneapolis, five bunches pie plant and six dozen asparagus.

H. N. Dean, Minneapolis, pie plant.

H. N. Dyar, Long Lake, two quarts Sharpless strawberries.

Fred Busch, Richfield, three heads cabbage, three of cauliflower and six cucumbers.

N. H. Reves, Minneapolis, six heads lettuce and six onions.

Mrs. M. A. Pearce, Minneapolis, boquet roses.

M. Pearce, Minneapolis, two quarts Sharpless strawberries.

C. A. Smith, Minneapolis, collection geraniums.

Mrs. M. J. Hillman, Minneapolis, potted plants.

E. A. Ostergreen, St. Paul, three heads cauliflower.

J. F. Gilmore, Minneapolis, Stewart seedling currants, Hixon and Smith's Improved Gooseberries, and James Vick strawberries.

F. H. Busse, Minneapolis, three quarts Crescent, one quart Wilson, one-half dozen plants with fruit (Crescent), three stems seedling strawberry, eight boxes of Crescent and Wilson strawberries.

Prof. L. Asire, Minneapolis, Crescent and Glendale strawberries, three quarts each.

G. S. Woolsey, Minneapolis, strawberries of Wilson, Glendale, Crescent, Minnetonka Chief, Eureka, Manchester, Longfellow, Warner, Countess and Miners' Prolific.

J. T. Grimes, Minneapolis, three quarts Old Iron Clad, three quarts Piper's seedling, four bunches asparagus, six stalks pieplant and six varieties peonies.

Oliver Gibbs, Jr. Lake City, Glendale strawberries.

John Van Loon, La Crosse, Wis., three quarts Bidwell and three quarts Boyden No. 30 strawberries.

Mrs. M. E. Hintgen, La Crosse, Wis., three quarts Sharpless two quarts Glendale and two quarts seedling strawberries.

Wm. Lyons, Minneapolis, Minnesota seedling strawberries, Manchester and Minnetonka Chief; collection of vegetables.

J. S. Gray, Minneapolis, doz. heads lettuce; carrots, onions, cauliflower, pieplant, turnips, raddish, Dill.

AFTERNOON SESSION.

The meeting was called to order by President Truman M. Smith of St. Paul, at 3 o'clock P. M., and the following committees were appointed:

On Fruit.—Ditus Day, Farmington; F. A. Conkling, Brooklyn, N. Y., and Isaac Gilpatrick, Minneapolis.

On Flowers.—A. W. Sias, Rochester; M. Pearce, Minneapolis, and Col. J. H. Stevens, Minneapolis.

On Vegetables.—Wyman Elliot, Minneapolis; H. H. Young, St. Paul, and G. W. Fuller, Litchfield.

On Resolutions.—J. S. Harris, La Crescent; G. W. Fuller, Litchfield, and J. T. Grimes, Minneapolis.

ADDRESS OF WELCOME AND RESPONSE.

Col. John H. Stevens, in the absence of Prof. Porter of the State University Farm, delivered the Address of Welcome.

Col. Stevens said: Mr. President and Gentlemen: It has been my pleasure to extend a welcome to the members of the State Horticultural Society to Minneapolis, nearly a score of times in the past and I regret that Prof. Porter is not present to attend to that part of the program and to discharge the duty assigned to him. I can only say, however, on behalf of the citizens of Minneapolis, that we most cordially welcome you here. You are engaged in a work that we all should and all do take a deep interest in; there is hardly a more inviting field for labor and usefulness than that of horticulture, and I hope and trust that in your deliberations you may accomplish that which will be for the good of the State, and that your efforts will be crowned with success. There is no doubt that the grand cause of horticulture in this State has been forwarded at least ten or fifteen years by your society beyond what it would have been without that assistance. Again bidding you welcome here we trust that your meeting will be attended with that interest which will give encouragement and success to your noble work in which you are engaged.

The response to the address of welcome was delivered by President Smith.

President Smith. I see they have me down for a speech, but I am unprepared. However I will say a few words. The people of Minnesota who, like Col. Stevens and myself, can look back to a period thirty or thirty-five years ago and view the progress made during that time within what is now the city of Minneapolis, may be gratified at the progress made in a material way, and when they think of the condition of things then and contrast them with those of to-day, they will see there has been plenty of work for the State Horticultural Society as well as other societies and institutions. When I first came on this side of the Falls of St. Anthony to the site of what is now Minneapolis, there was but one little log house standing away down here, [point-

ing in the direction of the Falls] and an old mill. Contrast that with what we see to-day, and behold the difference. Look at what has been done within that short space of time. At that time we were told that we could not even grow corn in Minnesota and we never would be able to grow fruit, and nothing of that sort could be expected in this climate. But look at the mills and manufactories of Minneapolis and St. Paul to-day, and then see the kinds and vast quantities of fruits constantly brought to market. It has been estimated that as many as sixteen thousand quarts of strawberries are daily brought to market at St. Paul and by 9 o'clock they are all cleaned off. This shows that population is rapidly increasing and it reminds us that we have a work to do. We must educate the people to grow those fruits and flowers that can be grown most successfully and prepare the way for future generations. It is a work of responsibility and there are few who realize the responsibility more than I do and their incapacity for the task that lies before us. I tell you that we must grow our own fruits and have a surplus to ship away, and not be dependent upon countries below to supply our wants in this regard, thus draining us of all our spare funds to purchase a few of the luxuries of life. And if we could interest the people and they would turn out en masse to our meetings and see our exhibits and learn how to plant and cultivate these fruits, flowers and vegetables, what a benefit it would be to the State and to the city as well. Minneapolis I must say has always given us an encouraging hand; they have always been ready to welcome us. There is no city or town in the state that has been more ready to welcome horticulture and horticulturists than Minneapolis. Thanking the citizens of Minneapolis on behalf of the Society for their hospitality I will not occupy your time further.

COMMUNICATIONS.

The following communications were then read by the secretary:

FROM A. L. HATCH, ITHICA, WIS.

Mr. A. L. Hatch of Ithica, Wis., under date of May 9, 1885, writes:

"S. D. Hillman, Secretary, etc.,

DEAR SIR: Your invitation of April 30th has awaited an answer because I have been too busy to reply sooner. I regret exceedingly my inability to comply with your request. Besides my ordinary farm and nursery cares, now so much behind on account of such extraordinary

weather, I am trying to build a dwelling and I have no leisure whatever. There is a bond of sympathy between us, augmented, no doubt by the disasters of the past very cold winter—such sympathy as comes from the commiseration of common misfortunes, if not from common success. No doubt after the many funeral services we shall be compelled to hold over dead pets and blighted hopes, we should get encouragement from a meeting of your Society, whose circumstances as horticulturists so nearly resemble our own. As it is we can only offer you our good will and hope ere long to be able to render you material assistance in your horticultural work, so courageously undertaken.

Respectfully,

A. L. HATCH."

FRUIT REPORT, BY GEO. J. KELLOGG, JANESVILLE, WIS.

The following fruit report was then read:

The effects of the past winter are very disastrous and singularly marked, especially among small fruits. Among apple trees there is the finishing up of our borne trees, and of those partially killed the two previous winters. In the orchard Red Astrichan, Golden Russet, Talman Sweet and many others of this hardy list have lost a limb and occasionally a tree. Willow Twig seems least effected in the orchard of any winter apple in the nursery, it frequently injures badly—Duchess and Tetofsky are most hardy of all; though most of the new Russians seem hardy enough but are predisposed to blights. The winter of 1882-3 was more severe on apples than any winter for the last ten years. I had Wealthy kill to the ground in the nursery and everything but Duchess, Tetofsky and New Russian were more or less injured. Among the Raspberries *new* plantations have suffered least. Turner and Crimson Beauty seem most hardy among the Red. Old Plantations of Cuthbert and Brandywine, Hansell and Sheffers Colossal are killed to snow line and in some cases to the ground, while new plantations of the same kind are fruiting to the tips. Among the blacks about the same appearance with Gregg, Tyler, Sonhegan, Onandaga, Ohio, M. Cluster, &c. The old plantations are hardly worth standing, some even killed to the ground, while most of the new plantings are fruiting to the tips.

Strawberries, except when not covered and in low places, have wintered well and are loaded with fruit—of the comparative value of kinds it is too early to form a correct opinion.

Crescent beats all for production while Countess is a profitable fertilizer.

Vick and Piper give abundant promise, but if their promises are not redeemed better than last year they will go under with many others.

Blackberries are a failure unless protected; the Dewberry is easiest covered and the earliest to ripen, gives a good crop when well cultivated. The Snyder and Stone's Hardy are showing an occasional branch in bloom when unprotected. Taylor's Prolific, Ancient Briton, Western Triumph, Early Harvest, Stayman's Early and many others have shared a like fate. Acres have been mowed and burned—there is no safety except by covering, and even then there is danger of uncovering just before a prize and get the tender buds nipped.

The grapes are promising full, when well cared for—there is no use trying to raise any fruit without care.

Truly the horticulturists' path is strewn with thorns beside those on roses.

GEO. J. KELLOGG.

JANESVILLE, WISCONSIN, June 15, 1885.

A letter was read from C. Hamilton, of Ripon, Wis., regretting his inability to be present at the meeting and enclosing a paper on small fruits, furnished by request, and closing with good wishes for the success of the Society, etc. The paper referred to will appear further along in this report.

FRUIT REPORT BY ANDREW PETERSON, WACONIA.

The following report on Russian varieties of fruit, from Mr. Peterson of Waconia, was then read:

WACONIA, CARVER CO., MINN., JUNE 19, 1885.

S. D. Hillman, Secretary, etc.

DEAR SIR: I am very thankful for the program and the letter you send me, but am sorry to say that I cannot be at the meeting, as I shall not be at home at that time. I send you a short report on the condition of apple trees after the past severe winter at my place. Most of the Wealthy are entirely killed and the rest are so badly damaged they will probably die another year. The Duchess is damaged a good deal. Some of the Russian varieties, perhaps eight or ten, are injured more or less; some of them I suppose will die. Little Seedling and Transparent are not hardy trees. The Christmas apple seems

hardy. The varieties that withstood the past hard winter are the following: Hiberna, Ostrekoff's Glass, Charlemoff, Lieby, Red Checked. All of these look as nice as ever before, and there is a great deal of fruit on the trees. I have been in Minnesota over thirty years but I never saw so much damage done to fruit trees as we have had from the past winter. Early Richmond and Mountain Hess cherry trees, ten years old, are entirely killed.

Very Respectfully,

ANDREW PETERSON.

FROM PROF. J. L. BUDD, AMES, IOWA.

The following letter from Prof. Budd, of the Iowa Agricultural College, was then read:

Secy. Minn. State Horticultural Society.

MY DEAR SIR: I am sorry that I cannot meet with you as I wish to go to Washington with a view to getting aid from the Department of Agriculture in our adapting fruits, etc., to our Valley.

The past winter has wrought fearful havoc with our old list of fruits, but the Wealthy, Duchess and all the true Russ apples came out clean and white as did a few of the Russian pears, all of the plums from the East plain and all of the cherries and shrubs from Central Russia. For once theory and practice walk hand in hand. What I wrote from Europe two years ago has been verified by this last winter to a dot. In other words the products of like soils and climates live with us.

J. L. B.

FROM A. G. TUTTLE, BARABOO, WIS.

The following communication was read from A. G. Tuttle, of Baraboo, Wis.:

BARABOO, WIS., June 22, 1885.

S. D. Hillman, Esq.

DEAR SIR: I received your letter with sheets of your report. I find that what I said at your meeting is somewhat mixed up; I have made some corrections and return them.

Prof. Budd claims not to have been correctly reported in what I said about my list of Russian apples. You will find in one of your reports a letter from him to your secretary in which he says that the Russians that I have are not from interior Russia and not adapted

to Minnesota. I wrote him in regard to it, and the only excuse he made was that he did not expect the letter to be published. I have no desire for any controversy with Prof. Budd, for I believe we agree on this, that there is absolute certainty that the Russian fruits will prove perfectly adapted to the great prairie regions of the northwest. This is what we aim to prove and what the people would be glad to know. If I ever had any doubts of their perfect adaptation the results of the *extreme, long continued cold* of last winter and its effect upon our orchards, destroying nearly everything of American origin while at the same time all the new Russian apples and pears are in splendid condition—is proof positive to me that they are just what we need and that they have just come in time.

I am confident that there are none among them but what are as hardy as the Wealthy, even those the most tender, and very many of them are much hardier than the Duchess; among them is the Hibernial, its large, dark, glossy foliage and enormous crop of fruit tells its story of extreme hardship, after passing through such a trying winter. Longfield, after maturing a crop of fruit the largest ever borne by any ten on my place comes out this spring perfectly healthy though showing but little fruit. The Antonooka never looked better; we had a single apple of that variety last season, which I have yet in good condition. There never has been such a universal wreck. Trees that have stood in my orchard for over thirty years coming out of all the severe winters, during that time uninjured are now dead by the hundred. I have one orchard of 300 trees each alternate row Duchess and Utters. There are not five trees of the Utters that will ever recover, and some of the Duchess are badly injured but only a few; which seems very strange, as in my Russian orchard of over eighty varieties not a tree is injured. The bright and healthy foliage of this orchard in contrast with my orchard of common varieties will satisfy any one of the value to us of Russian apples.

I should be glad to give you more information about our Russian fruits but my time is so fully occupied I must close this hastily written letter.

Yours &c.

A. G. TUTTLE.

The following report of the secretary of the Missouri Horticultural Society was read:

“The fruit prospect June 1st, is somewhat better than was expected

after the cold spring. The prospect for a full crop is as follows, 100 representing a full crop:

Apples, 66 per cent; Plums, 71 per cent; Pears, 65 per cent; Cherries, 64 per cent; Grapes, 51 per cent; Raspberries, 84 per cent; Strawberries, 93 per cent; Blackberries, 41 per cent.

Peaches are an entire failure, except south of Springfield; after going below 37 degrees, we find there is quite a full crop, so that in the southern part of the State, especially the last tier of counties, we find an average of 78 per cent given. In many parts of the State the report shows that the peach trees are injured very badly, and that many thousands of trees are dead or dying. As matters now stand we must look to the southern part of our State for peaches in the future. But we must plant more in all parts of the State—make another trial.

Apples. The best prospect for apples seems to be in the southern third of the State. Much complaint is being made of their falling off, and the report in August will change this report considerably.

Strawberries will be abundant and low in price.

Raspberries will also be quite abundant, more so than last year.

Blackberries are poor and will be scarce. With the rust and cold winter injuring the plants, we find that the fruit will be in extra demand this season.

Grapes also will be in good demand, and the finer varieties will be very hard to get, being very much injured by the winter.

The varieties having the best prospects are:

Apples—Ben Davis, Willow Twig, Maiden Blush, Huntsman, Red Astrichan, Early Harvest, Jonathan, Missouri Pippin.

Pears—Bartlett, Seckel, Buffum B. Anjon.

Plum—Wild Goose, Weaver, Miner.

Cherry—Early Richmond, Ostheim, English Morello.

Trees injured by winter are nearly all varieties of peach, all tender cherries and a few varieties of apples. Some have been injured by bursting of the bark, others by the branches being frozen. Many varieties of grapes were badly injured, notably the Gœthe, Wilder, Lady Washington, Herbemont, Creveling, Catawba, Hartford, and even Nortons and Isabella. Raspberries were injured in some portions of the State; the Cuthbert not standing the cold well; even Turner and Thwack in low places are injured. In very few locations do the newer sorts seem to be hardy. But one variety of blackberries seems to be hardy, and that is the Snyder. We must look for some new blackberry—some native which will be both hardy and productive. I be-

lieve this can be found, and will be, if we look for it; then we can raise some as fine blackberries as were seen years ago.

The whole of this report I believe will be lowered by the August report, and I fear we will yet have to report less than half a crop of apples, perhaps even one-third.

The reports from other States have not yet been received, but from private sources I believe that few States will have more than half a crop of apples.

L. A. GOODMAN, Secretary."

President Smith announced the next thing in order would be a paper from Mr. Pearce, of Minneapolis.

STRAWBERRY CULTURE.

BY M. PEARCE.

Mr. President, I am at a loss in determining what to say to catch the attention of horticulturists and arouse them to action on this, a subject of the utmost importance to farmers and all having houses and homes, and especially those located in the vast prairie districts. Of all fruits I know of nothing earlier or more reliable than the strawberry, and no crop gives better profit to the grower. The cost of plowing one acre of corn land is \$2; harrowing, seventy-five cents; 7,000 strawberry plants, \$28; planting them with a line three and one-half feet one way and fifteen inches the other, \$5; cultivating and hoeing during the summer, \$12; mulching very lightly in the winter with marsh hay or straw, \$6—making a total cost per acre of \$53.75. This covers all material expenses up to the picking season. An average crop per acre of a good variety of strawberry should not be less than 250 bushels, and with the best of soil and cultivation and abundance of water, the number of bushels per acre can be increased to 500. On a basis of 250 bushels at the low rate of ten cents per quart, the value will be \$800 per acre; the expense of picking, boxes and crates, \$240, having a net profit of \$560 per acre.

The greatest care should be used in getting new and pure varieties of plants; never take from old beds, and get plants from those who use and know how to grow good plants; avoid new varieties with fancy prices, and use only the old and established kinds. Matted rows and hills have their advocates, and both are good—my greatest success having been with matted rows, as follows: Select a moderately rich

piece of ground, nearly level, and surrounded by high grounds, because the berry field will then get the wash of the surrounding land and catch the snow of winter, which is the best of all mulching material; plow deep and harrow level and fine, set out with a line and have the rows straight; have the plants tied in bunches of fifty, taken up with the full length of the roots. When ready to plant, dip the roots of fifty plants in water, and then distribute them along the line where they are to be set out; then with a dibble of iron or wood set them out as quickly as possible, putting the roots down full length, and press the soil about them. If land is scarce they can be planted closer each way.

What varieties to plant is of the greatest importance. In new and rich ground the Wilson is a good variety—one of the very best for shipping; but as a general thing it gives a poor yield on old land, if not well manured and provided with abundance of water. The Crescent seedling is the hardiest and most prolific of any variety known. By many it is considered a pistillate variety, but such is not the case; it is an hermaphrodite but too weak to be depended on as a perfect fertilizer. In all cases, in order to insure a crop every third or fourth row should be planted to some perfect flowering plant, such as the Wilson, Glendale or other hardy variety with perfect blossom. It is at home in all soils and localities, and if every third or fourth row is planted to the Wilson or Glendale it will give a large yield of fine fruit. Stick to old varieties, such as the Wilson, Crescent, Green's Prolific, Downer's; and on sandy soil the Countess. After the plants are set out and well started, the soil should be frequently stirred with a light cultivator with narrow teeth, that will keep the ground level and not hill up the plants, but if the plants are in perfect line but little harrowing will be necessary. When the plants throw out runners the cultivation should all be one way. In the fall when the vegetation ceases and there is a good stand of plants, there will be matted rows from one foot to fifteen inches wide with an open space between the rows. Mulch lightly on the first permanent fall of snow. In the spring rake the mulching on the open spaces between the rows and let it there remain. The second year about all that can be done will be to pull out the weeds and grass and plow up after the fruiting season. Failure often occurs by taking plants from very rich soil and transplanting to poorer. Plants should always be transplanted to richer soil to warrant success. In ordering plants a description of soil and condition should always accompany the order to an intelligent plant grower.

DISCUSSION.

Président Smith. You have heard the paper read by Mr. Pearce. Discussion would now be in order. It is a subject that should bring out some discussion.

Mr. A. W. Sias. Mr. President, Mr. Pearce speaks of planting the Countess on sandy soil, as I understood him. I believe that a great many growers claim that the Countess is identical with Downer's Prolific. I have known of Downer's Prolific, or the Countess, to be grown on clay soil, where it proved to be very fine. I think perhaps that it stands next to the Crescent as to profitableness, but I would like to hear from others. If the Countess is the same as Downer's it will succeed on sandy soil. I would inquire of Mr. Pearce if he considers them the same?

Mr. Pearce. I have heretofore considered them identical but have changed my mind. After a careful comparison I think beyond doubt there is a difference. The Countess seems to be peculiarly adapted to sandy soil, although it also does well on high land and a clay soil. Mr. Wm. Lyons had very good success with it on sandy soil and he thinks there is nothing that equals the Countess. It is a very fine berry and ought to be generally grown. It is very hardy and the vines are free from rust, while the Downer is subject to rust; the Countess produces large berries, while those of the Downer are smaller.

Col. Stevens. Mr. President, I would like to inquire if anyone knows how the Countess was introduced into this state? A few years ago I was told that it was introduced by Chas. H. Clark, of this county, who received some ten or twelve plants from France, subsequently, or some years afterwards, Downer's Prolific was introduced; of course you all know about that. In the opinion of many members of the Society the Downer has been considered to be the same berry. I would like to have Mr. Elliot, or some of these early horticulturists, explain the difference in these varieties, if any of them can do so.

Mr. Pearce. Mr. Clark told me that he was in Washington and while visiting the Agricultural bureau he came to the department of strawberries, where he found many imported varieties. He saw one variety that appeared to be very promising and asked the gentleman in charge to send him a dozen plants. He afterwards received the plants marked as the Countess, imported from France.

Mr. J. S. Harris. Mr. President, I do not wish to join in any discussion on this question, but I remember seeing the Downer's Prolific some two years before Mr. Clark received the Countess, which I knew

of as he sent me some of the plants as soon as he could get them. I planted them side by side with the Downer and after keeping them two or three years allowed them to run together, as I could discover no difference, either in size of berry or quality of fruit. I believe them to be identical and also that they are a profitable variety for farmers to plant. I believe there is no more profitable variety. It was originated by a man in Kentucky who also originated the Charles Downing, a few years later. I agree with Mr. Pearce that there is no berry that can surpass the Crescent seedling in hardiness and productiveness; but if not properly fertilized it is inclined to be knotty or imperfect, especially after the first picking. I don't consider it the farmers' berry because it needs some other variety with it to fertilize it and they are usually too busy to attend to their proper cultivation. I do not quite agree with him that we should fertilize with the Wilson or Glendale; there is too much difference in the varieties as to the kind of soil required and the habits of the plants in order to have the best results.' The Crescent will often bear heavily after it becomes partially overrun with blue grass or white clover; the Wilson will produce nothing under such circumstances. A heavy fall of snow is apt to smother the plants; if you set them you are obliged to set with some perfect blooming variety or your first setting of the Crescent will probably be a failure. With the Glendale I am not so well acquainted. If it blossoms as soon as the Crescent I am inclined to think it will be one of the very best. The Downer, or Countess, I believe upon all ordinary soils the very best to set in rotation with Crescent seedling. The color of the berries is about the same but the flavor of the Downer is a little bit better than that of the Crescent. I think it gives the best satisfaction to fertilize with the Downer; it is about as hardy as the Crescent. I have them growing on my place where I had berries seventeen years ago. And we get good berries there now; the plants perpetuate themselves. It is one of the fittest berries for the man that is too lazy to keep the weeds out. Speaking about rich soil, the Crescent on very rich soil will not produce as large a berry as on medium good soil; the berry is soft and destitute of flavor. There is probably no berry in our list that we have recommended that we want to be more careful in over-feeding, that is, when set on strong soil, such as I have, than the Crescent, if we want fruit that is of any value.

Mr. H. F. Busse. In regard to the fertilizing I would say that I do not agree with Mr. Harris. I have raised them and fertilized with different kinds, and I think on clay soil where the Wilson will do any-

thing it ought to be fertilized with the Wilson. The fruit is about the same as to firmness and color, and there is nothing that bears shipping better than the Crescent. But if fertilized with the Countess they are apt to be very soft; I think too soft to ship any distance. Fertilizing with Wilson you will find a great difference in that respect. I have some on the table there that one would almost call the Wilson; they are about the same in color, are firm and nearly alike in shape. I prefer the Wilson as the best to fertilize for that purpose.

Mr. Pearce. I want to add a word to what has been said about fertilizing the Crescent. It is the earliest berry we have and it is also one of the latest, and that is one reason why we can sell it to farmers. They need to be fertilized clear through their season; I would therefore fertilize with Wilson, Glendale and Downer's Prolific. I think we should never confine ourselves to one fertilizer but have two or three good varieties. The more you fertilize the better the berries. The Countess is good, the Wilson is good, Charles Downing is good, and James Vick is good. It don't hurt to put them all in, for if one misses another may hit.

Mr. Harris. I don't think it is best to have too many kinds in one patch if you are going to send your berries to market. At a certain meeting about a year ago I said that I thought it made a difference in the quality of the berry to fertilize with different varieties. From experiments I have conducted the past season I am inclined to think I was mistaken and that it is something in the air, or in the soil that makes the Crescents darker one season than another. This spring I set out Crescents and fertilized a section of the bed with Wilson, a section with Sharpless, a section with the Downing, a section with a variety that I procured in La Crosse that they call the Foundling, with Hart's Minnesota, and with another variety that I obtained at St. Charles; and on picking the berries and examining them I could not see any difference between those fertilized with one variety from that of another, and I don't think any one else can. This may be owing to the season. I am inclined to think that the influence of the male plant upon the other the present year doesn't have any impression. Those plants planted and fertilized with different varieties the progeny would be different; but of course one year don't settle this question any more than "one swallow don't make a summer"

Mr. G. W. Fuller. Downer's Prolific and Countess are very much alike. The Sharpless, of course, you detect anywhere. I have experimented a little with covering. Those that I covered came off the

earliest that I had. It seems to me that Mr. Pearce's direction for covering after the first snow falls hardly answers every year; sometimes we don't get snow until in January. We have to cover right away after the first freeze to amount to anything.

Mr. Pearce. I am inclined to think it is a mistake to put on the covering too early in the season, before the leaves are killed to the ground. From tests I have made with mulching I have found my best success has been with mulching on the snow in the middle of winter, or say in January. With strawberries the injury is not done in the fore part of winter but in the spring; I speak from experience and observation. I know of perhaps twenty beds of strawberries where the plants were completely killed by mulching last fall. The snow came on top of them and smothered them. If you wish you can mulch in the fall, if careful not to smother the plants.

Mr J. C. Kramer. Mr. President and gentlemen: I would like to ask the question. What do we understand about this fertilizing the strawberry? Some say there is nothing of it. We cannot make them produce fruit by using manure or by working, but the other we can do; for example I have a seedling here that I have grown for several years. It is a seedling of the Wilson. I raised it for three years and didn't get any fruit although it was always full of blossoms. I didn't know anything about the habits of the plant, but finally got a catalogue from the east from a gardener, and there was a full explanation given of the difference in the blossoms. I examined my plants and I could see the difference. I found my seedling was a pistillate variety. So I went to another bed where I had what we call the Iowa King which has a full blossom. I took some of those plants and set them out with the seedlings, and I had the John Hart seedling on the other side; as a result I took twelve quarts of berries from a square rod at the first picking. Before this I had nothing but blossoms for three years. I had been fooled for three years. So I made me an implement out of an old cross-cut saw to transplant with, and I go to a row of full blossom plants and set one from them every eight feet; I take the plants up with that machine and set them right in and don't disturb the roots. I set the plants out in this way and got a crop. After that I took the Glendale and mixed them among a dozen kinds of seedlings and the fruit showed the effects and the berries were of the shape of the Glendale. We cannot understand it but there is a Higher Power above that gives us the blessing.

Mr. Harris. Did you pick Glendales from the seedlings?

Mr. Kramer. No; but there was a mixture of the two kinds. I have been experimenting and have perhaps 500 different plants. I have about a dozen different kinds of berries here; some that I set a year ago are now bearing. I have one seedling three years old that I think will beat the Crescent to death.

Mr. Harris. That machine which Mr. Kramer speaks of was made in this way: He took a piece of a cross-cut saw about five inches wide and had it bent in a circle but the ends not welded together. He has a piece of iron rivetted on where the two ends would come together and has a wooden handle. He can take up a plant with this without disturbing the roots; it is a most excellent plan for transplanting strawberries. It costs perhaps twenty-five cents to make if you can get an old saw blade.

Mr. Smith. I have fertilized a bed of strawberries in the same manner. In regard to the subject of fertilizing, I would say that I think there is a marked effect upon the fruit. I had a lot of Michigan seedlings which I fertilized with Wilson and Glendale, and if you could have seen them you would have been convinced that it had an effect upon the fruit. The seedlings were soft and light colored; those fertilized with Wilson were rounder in shape and darker in color and very much firmer; the same with those fertilized with Glendale.

Mr. Harris. Was that this year?

Mr. Smith. That was three years ago.

Mr. Harris. I think I was of the same opinion at that time and made a statement to that effect at the time. But I conducted a careful experiment this year and I wanted to take back what I said at that time.

Mr. Smith. I made some notes upon the paper read by Mr. Pearce. This matter of mulching in the fall or winter; as to which is to be preferred depends on circumstances. If plants are not standing very thick together and the ground has been cultivated late in the season it will be of advantage to mulch early; if plants grow thick together and the ground has not been cultivated it is as well to mulch in the winter. If the ground is clean and liable to crack—as much garden soil is—the plants will not be injured by mulching in the fall. In regard to fertilizing the Crescent. On strong clay soil I would recommend to use the Wilson as you cannot do any better. You cannot depend on the effect of fertilization from the fact that Crescents grown on high, clay soil would be much firmer and of much better color than if grown on a lighter soil and with plenty of rotted manure around them.

Mr. Harris. They would be darker in color also would they not?

Mr. Smith. Yes. In regard to this question of manuring the Crescent; if plants are close together, by manuring you will spoil the fruit. You can manure heavily by giving plants plenty of room. If you manure heavily enough and cultivate well enough to cause the plants to grow a foot high there should be a space of three feet for the plants to grow in. If the soil is poor they do not need so much space. But if the plants are a long ways apart you can manure heavily and cultivate. As to this matter of the Countess which we have discussed so often, the question of its identity is continually coming up. We have the fruit here and you will notice the pink shade at the stem which is more distinct than on the Downer, which always has a smooth stem. Is not that color an indication of foreign blood in this Countess? I think it would be well to settle the question as to whether they are identical. For farmers who have sandy soil it is the best variety we have, because it needs no fertilization and is good enough for anybody to eat, and as Mr. Harris says, it is good for years without any attention.

President Smith. If there is nothing further I would suggest that we hear from our former secretary, the commissioner for Minnesota at New Orleans, Mr. Gibbs. I presume the members would be pleased to hear from him.

REMARKS BY MR. GIBBS.

Mr. Oliver Gibbs, Jr. Mr. President and Fellow Members: It affords me pleasure to meet with you again, the old Horticultural Society, and to say a few words to you although I have nothing special to offer upon any matter under discussion. I wish to congratulate you, however, upon the thought that occurs to my mind, which I have found in the last six months to be well supported by facts, that although your Society is not large in numbers you have a reputation abroad in horticultural work that places you in the very front rank. Wherever I go I find the reports of the Minnesota Horticultural Society well spoken of; I find the labors of its older members well appreciated; and I find all the most advanced horticulturists who are looking to the interest of experimental lines in the development of new and hardy varieties of fruits, directing their attention to Minnesota and expecting to gain the most valuable information in those lines from the experiments that are going on under the auspices of this Society.

At New Orleans I did not find time, owing to the heavy pressure upon me in the care of the exhibits of the State, to spend any time whatever with the horticulturists in their special meetings. But I met them all from time to time in my walks about the exposition buildings. Most of them spent time examining our fruits and exhibits, and I learned there the views that I have expressed in regard to your position and reputation abroad.

Although my time, during this last year, has not been devoted as closely to the interests of this Society as I could wish, yet in my attention to other duties I trust that the horticultural interests of the State have not been neglected.

I think, gentlemen of the Society, that there was no question at New Orleans but that the Minnesota collection of apples was the handsomest and the largest and the best in the entire Exposition. In fact it was the only collection where apples were put up attractively and in large quantities in one exhibit. We had about two hundred bushels of apples to show there to represent our State—largely composed of our Wealthy, an apple which attracts more attention than any other variety in the world wherever you carry it. We put them up in large masses, in order that the admirers of that apple might see it in quantity and in its beauty as grown in the country where it originated.

It affords me much pleasure to say that the style of the exhibit made by the chief of installation, as devised by Prof. Porter, who sits here by my side, and who sketched out the whole plan of the Exhibit at New Orleans, was thoroughly artistic and well adapted to show all the varieties of apples that we raise here, to the best advantage. Massing our Wealthies for our large exhibits, we placed upon them and over them, for purposes of color, something over a hundred varieties of others, and there being some sixty bushels of them always in sight, made a very attractive exhibit.

Mr. Gould, to whose industry and that of his wife and daughter, we are mainly indebted for the show of the fruit and the care of it at New Orleans, has made you a most excellent report. I do not think I could add to that report, and I presume it has already gone into your Annual Report for the past year. I wish, however, here to express to the Society my thanks to him for the great industry, patience and perseverance with which he collected that fruit. To him is due the fact that we had so large and complete a collection. His services in that regard fully sustain the theory upon which he

was appointed, that was, that he was a man who would work faithfully and thoroughly, leaving no stone unturned to accomplish whatever he put his hand to and whatever trust he accepted. Let that be my testimony, then, on your records to the services of Mr. Gould; and as I have said before, to Prof. Porter, our chief of installation, are we chiefly indebted for the very attractive character of that show.

I wish here to emphasize the advantage that Minnesota gained in the display of her grapes at New Orleans. You already know that we took nearly all the premiums on single plates of varieties of grapes grown east of the Rocky Mountains. We did not get those premiums by mere chance or good fortune; but we had heavy competition; we had the Delaware from Ohio the place where it originated, and we beat Ohio with her own grape on her own ground; and we had many others of the most favored varieties of other States in competition with the Minnesota grapes, and although we had held them nearly five months after they were ripe before they were shown up for competition—that is to the middle of January—they were in fair condition, so that the committee did not hesitate to declare that upon the point of condition alone they were entitled to the premiums, and by comparison with the others, they were so far superior that they had a walk-away with the premiums. I think as it is stated in the report that we have eight first premiums on single plates and four silver medals on collections. I think our fruit display there has done a great deal to encourage people to emigrate to Minnesota. We do not claim that all the fruits that were shown there could be grown here profitably, but we presented them as evidences of the necessity and possibilities of fruit culture, and I think that all intelligent horticulturists that saw that fruit display were ready to agree with us, that in a climate where such fruits of such quality and beauty can be produced with the final success that we all hope for in the growing of apples, is something that is worth fighting for. I think any horticulturist, after seeing that display, other things being favorable, would be willing to take his chances in a country where it was possible to raise such fruit. This in view of the fact that apple raising as a business, compared with other products of the soil, might be some years at the foot and to come as the result of further experiments.

I make these remarks, gentleman, to indicate that horticulture and the Minnesota Horticultural Society received their full share of

attention in the large effort we made to represent all the industries of our State. Going there as I did the representative of the State Horticultural Society, if there was any department which more than any other I regarded as my pet department and wanted to see it at its best, it was the Horticultural Department. We did not give it any advantage over any other, as you are probably aware who have seen the reports. We aimed to carry the State to the top notch everywhere where we were in competition with others.

You are already aware that we established the reputation of our butter to be of a quality equal to the finest gilt-edge product produced anywhere in the world, although the improvements in the manufacture of butter have been so general that in these exhibits, where all parties are straining every nerve to get the blue ribbon, there is but a line of difference sometimes between the different samples, and judges have to figure very close to determine where the superiority lies. Still with all this to contend against and the closeness of judging, we were enabled out of the grasses, and water, and climate, and cattle, and skill of Minnesota, to get the award for making the best butter to be produced in the whole world. [Applause.]

And I want to say here for your satisfaction that there was no element of chance and no element of favoritism that entered into that award. I speak of this here for I think these two branches of dairying and of horticulture are more important to the country than any other branches of farm industry, and I believe I speak a fact that has not been published and am therefore excusable for introducing it here. To show how close those things were in that business of competition; it was the earnest desire of every person exhibiting at that exposition for premiums on dairy products, that the best experts in the world should do the judging, men in whom all had confidence; their success in the markets depended upon these awards and they wanted no foolishness in the matter. Hence business interests compelled them to agree upon judges of the very highest character. They sent for men and brought them there for that special duty whose reputation was as good for judging of the quality of butter as that of any stockman would be for judging of the points of an animal, so easily distinguished by the eye, and as those grand sweepstakes of the world, this gold medal, was so important they selected all of the packages in all the different classes that had received first premiums and placed them in a room together and then sent for that committee of judges and told them,

out of those packages to select the one package which they found on a close and on the most critical analysis to be the best. At the conclusion of their work they found two packages upon which they were divided in sentiment; and upon the closest test they found only one-half point of difference. Finally they agreed upon their award of the premium and then curiosity asked for the history of the package that they had selected. Giving its number they found that while they had given the grand award to Minnesota the one that was so near equal to it in merit was another package of Minnesota butter. [Applause.] And added to that the fact which was further ascertained that it was a package of Norwegian butter. [Laughter.] Let our Scandinavian friends about the State take that to their credit and the next time we get up an exposition let them add on another point and take the award.

Mr. Grimes. What was the "nativity" of the best package?

Mr. Gibbs. It was made by Wm. H. Patten of Le Sueur; the other by Mr. Olson of Spring Valley.

Mr. President, I have taken up too much of your time. I want to congratulate the Society (and I want your Secretary to be obliged to take down what I say,) upon your good fortune and your excellent judgment in the selection of my successor. I know him to be well worthy and qualified for the position, a good deal better qualified than the person that he succeeded, and I hope that he will be so enthusiastic in his work that he may assist greatly in developing horticultural work in Minnesota. I wish him every success.

Mr. President, I wish to say a word as to the plate glass transparency, or our pomological medal. We got it up to represent the work being done in the horticultural industry; it was very finely painted and was some three feet in diameter, and was intended to be shown to good effect by electric light; we found it looked so well that we never lit it up. I have the consent of the governor to turn it over to the Society.

REMARKS BY PROF. PORTER.

Prof. E. D. Porter being called upon for some remarks came forward and said: Well, gentlemen, an attempt upon my part to add to what Mr. Gibbs has said would be very much like attempting to add to Bunker Hill monument by putting dirt around its base; it would only tend to conceal the monument. But I will say as long

as you have called upon me a few words. You had me down for an address of welcome without any consultation with me, but that was not at all necessary, and I had intended to be here at two o'clock to-day to make that address to the strangers or members in attendance here at the meetings of the Horticultural Society. But unfortunately I was obliged to be at St. Paul at that hour to attend to some business connected with the State University, and was detained; consequently I could not be here at the hour you had indicated.

I will say in reference to the work at New Orleans that this Society is largely indebted for the reputation which the State has acquired at the Exposition, as well as at the meeting of the American Pomological Society at Philadelphia two years ago, to the energy and efficiency of Mr. Gibbs. These premiums have caused much remark. Why, they say, "How in the world is it that you men up there in Minnesota can do these things, where you have such a climate? If you get an apple once that has merit you want to blow it all over the world!" [Laughter.] Why is it, they say, that you can go to work and "scoop" the whole country? Well, the truth of the matter is, the credit for the taking of these premiums is largely due to the skill and care, and to the persistent energy of Mr. Gibbs. In the first place everything that was worthy of exhibition from Minnesota was gathered up by Mr. Gibbs and taken to Philadelphia. I won't say everything, but samples of nearly everything of value, were taken by him two years ago to Philadelphia and placed in competition with the fruit on exhibition from other States. It was handled very carefully and was shown in its height of perfection. And the result was that there was no other way but to give the first premium to Minnesota. It was the best fruit on exhibition there.

It was the same way at New Orleans. We had some two hundred bushels of apples to exhibit. We did the very best we could with what we had at our disposal. The fruit was very carefully selected and it was very carefully handled; it was placed in cold storage and kept in that state, no heat being allowed in the car except what came from a coal-oil stove; it remained in this condition for some two months till the opportune time came for the exhibition of our fruit; and I may say that this was against the persistent demands made that we should show our fruit at an earlier date. They wanted to know why we didn't put out our fruit and put it on competition;

if we had done so we would have lost all the premiums. But we kept the fruit in cold storage by the orders of Mr. Gibbs until it was taken out and massed upon our tables. And when our two hundred bushels of apples were taken out they were in just as fine condition as when they came off the trees. That is the secret of the success and it is due to Mr. Gibbs.

Now, Mr. Gibbs has spoken especially of the results of Minnesota's labors in the horticultural and dairy interests—but two of the great industries represented there. I wish to say that by common consent Minnesota had the cleanest and really the finest exhibit brought together there in New Orleans. It was the finest exhibit on the floor, representing all the varied resources and industry of our State. We did not go there to make a grand show of our manufactured goods; it was our resources that we wished to exhibit. It was the evidences of progress that we brought there, and we had the best in the Union by common consent; I think we had twenty-one separate and distinct departments in our exhibit. In all these we were able to take premiums of the first class where they were offered, where brought into competition, and where we did not enter for competition we had honorable mention.

Mr. Gibbs has related the manner in which they decided who was entitled to the grand sweepstakes and gold medal for the best butter in the world. That means something to Minnesota. I have made some investigation and I find that five years ago we didn't produce in the State of Minnesota one-half of the butter consumed within the borders of the State. At that time there were but three creameries in the State; while in 1884 there were over one hundred creameries in full operation in the State of Minnesota and we exported or shipped last year thirty million pounds of butter. That shows the rapid development of the dairy interest and it is becoming one of the leading industries of Minnesota. As I said at St. Paul last winter we have a soil which is most fertile, a location which by nature is fitted for stock raising and dairying, as well as being adapted to the growth of wheat, or the cereals. The fact that in five years we have been enabled to bring up the dairy interest from nothing as you may say to export an amount of dairy products to come in competition with the dairies of the world shows the progress that is being made.

There is another department in which Minnesota stood at the head and that was the educational. We were brought into competi-

tion with all the States of the Union and all leading countries, Minnesota was honored by being the only State that got the grand diploma for the best educational exhibit. France received a diploma but Minnesota stood at the head. In fact we stood head and shoulders above all other States of the Union. In our educational exhibits and educational work we took many other premiums. They were not given through favoritism, because I tell you it was a bad place to show any favoritism when we had forty-five States and Territories which were represented by shrewd, keen men and each just as anxious to excel as the other. I tell you everything had to stand on its own merits.

Mr. Smith. Prof. Porter, before you sit down I would like to ask in regard to the plants and trees received from Prof. Budd this spring?

Prof. Porter. If you will excuse me I will present a short report of our Experimental Farm to-morrow, and I shall be very glad at that time to make a statement of the work we are doing in that line.

Mr. Smith. We have had a communication here from Prof. Budd. You will recollect that at the last annual meeting a resolution was passed commendatory of Hon. Norman J. Colman. Mr. Gibbs has spoken of the influence of our Society and I think in justice to the horticulturists of the west and to Prof. Budd, we should pass a resolution commending his work; I therefore offer the following if it it would be in order:

Resolved. That it is the sense of this Society that Prof. J. L. Budd is doing a good work for the horticultural interests of the Northwest.

Resolved. That we respectfully ask the Commissioner of Agriculture, Norman J. Colman, to render such assistance to Prof. Budd as is necessary to secure to the people of the Northwest the full benefits of his work.

Resolved. That a copy of these resolutions be forwarded to the Commissioner of Agriculture and to Prof. Budd.

Prof. Porter, in seconding the motion for the adoption of the resolutions, said:

Perhaps it would be well to make a short statement of the work that Prof. Budd is doing. Perhaps some may not know the fact that Prof. Budd, in connection with Mr. Gibb, of Quebec, three years ago this summer undertook an experimental tour through Russia, for the purpose of making a personal examination and investigation of the fruits of Russia and their adaptation to the corresponding soil and climate of this country. They visited sections of Russia having precisely the same natural topographical

features as our Northwestern country embraces, Iowa, Wisconsin and Minnesota, Western Kansas, Dakota, and the country immediately west, on our high, dry plains. They found there what you will find described in their reports, and it is unnecessary for me to repeat it. They brought back with them as the results of their investigations a large number of the most valuable plants, cions, cuttings from the most promising fruit trees and shrubs, ornamental and useful, that were to be found. Prof. Budd took his collection to the grounds of the Agricultural College at Ames, Iowa, where they have had careful propagation during the past two years. They arranged for other trees to be forwarded and have received two consignments, one each year, and have been very successful thus far with them. I placed myself in communication with him to get a list of these trees, etc., for our own State. He promised to furnish me with a supply of everything that would be of value to Minnesota, as soon as we were ready to receive them and they were tested there. I was with Prof. Budd for several weeks at New Orleans and I made arrangements with him then. This spring I sent down and secured from him grafts and buds of everything that he had and he sent me a complete collection of all of his fruits, shrubs and ornamental trees and plants. I have those all set out, and nearly all of them are in fine condition, and in the course of another year we shall be able to make a report to you of their success in the climate of Minnesota. To-morrow I will furnish a list of what we have for the information of the Society. In consideration of the labors of Prof. Budd that he has been engaged in, of so much value to the country, I most heartily and cheerfully second the adoption of the resolutions.

Mr. Fuller. Mr. Chairman, I most cordially favor the resolutions. I met Prof. Budd last winter and had heard of him before that. He is a man of good common sense, and it seems to me he is engaged in a work that he is going to carry through successfully. I think very much of him and of his work. I received a year ago considerable many of his trees and this spring he sent me another lot, and the best that he has that are adapted to our climate. Many of those received last year failed this spring; those he said were of the Russian varieties. A good many killed to the ground. One pear I received a year ago came out nicely.

Mr. Busse. I would like to make a remark on the work that has been done by Prof. Porter, Mr. Oliver Gibbs, also Mr. Gould, of Ex-

celsior, on what they have done for this Society. They have done a great deal especially in the line of fruit, and it is of more value to the Society than many may think. Their arrangement of the fruit in good condition and other farm products, and the care of it is worthy of praise especially what has been done by Prof. Porter. I think we ought to thank those gentlemen for the work they have accomplished.

Mr. Smith. I have known Prof. Budd for some twenty years and knew him before he was connected with the college at Ames. He was always a persistent worker in the interest of horticulture. He is a thorough horticulturist and has been all his life. I was very glad when he received the position he now holds in the Agricultural College. He has used the position to advance the cause of horticulture rather than the interests of J. L. Budd individually. Whatever assistance the Department of Agriculture can give him you may rest assured the people of the entire Northwest will derive the benefits from it as we could hardly expect from any other person in the Northwest. It is these considerations that lead me to urge the adoption of these resolutions.

The resolutions were adopted.

FROM PROF. TRELEASE, MADISON, WISCONSIN.

The following letter was then read from Prof. Wm. Trelease.

MADISON, WIS., June 25, 1885.

Dear Sir: I enclose copy of a somewhat rambling paper that I had prepared to read at your request at your meeting. I fear that it will be disappointing in the absence of specimens and diagrams. I regret very much my inability to attend the convention, which I know, from the program and the reputation of your Society, will be good. I trust, however, that I may enjoy the pleasure of meeting with you at some other time and beg to extend to you, on behalf of the Wisconsin Society our most hearty greeting.

Very Truly,

WM. TRELEASE.

Secretary Trelease had arranged to be present at the meeting but was unable to come owing to the meeting of the Wisconsin Horticultural society at Weyauwega on June 24 and 25.

Following is the paper furnished by Secretary Trelease:

A FEW COMMON APPLE FUNGI.

BY PROF. WILLIAM TRELEASE.

In preparing a paper to be read at a popular convention, like the present, I have assumed that the most satisfactory result will be reached not by giving an exhaustive account of one or more injurious species, but by speaking in general terms of a few forms which are so abundant as to attract general attention, without, however, going beyond the comprehension of ordinary observers.

Of late years the increasing damage inflicted upon our crops by the potato mildew, the grape mildew, the apple scab and a host of other vegetable parasites, has rendered every reader of agricultural journals, and, indeed, every farmer or orchardist of sufficient intelligence to look from effect back after cause, and to consult with his neighbors regarding both, familiar with the word *fungus*. Yet many of our most acute observers slip lamentably when they come to speak or write of these pests, for nothing is more common than to find the word fungus applied to anything from a gall on a horse to a knot on an oak tree, irrespective, even, of what a grammarian would call "number."



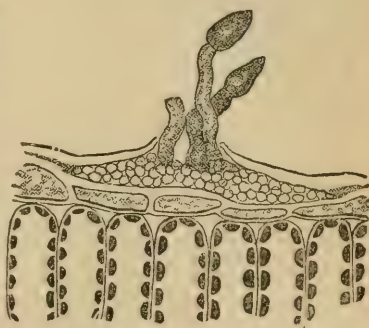
Famense leaf affected by *Fusicladium*
Natural size.

The word fungus, as properly used, indicates a plant of low organization, having nothing that can be compared with the leaves and trunk of a flowering plant, and entirely destitute of the green coloring matter (chlorophyll) to which the higher plants, and, indeed, many of the lower plants as well, owe their leaf-green color. As an English word, although it retains its Latin form, fungus should be rendered in the plural by funguses. To one with dull ears and a glib tongue this plural is proper, and a few of our brethren across the waters employ it. But the combination of grunts and hisses that it represents repels the majority of even those who hold that naturalization of a word, as of a citizen, carries with it the duty of conforming to all customs of its adopted country. For this reason the allowable English plural is

replaced, almost universally, by the shorter, better-sounding Latin plural—fungi.

No fact is better understood in vegetable physiology than that the chlorophyll or leaf-green of ordinary plants serves an important purpose in their nutrition. Without entering into the details of its usefulness, I may say that it acts, in a measure, as a tool, by means of which, using daylight as the motor power, the active portion of these plants (protoplasm) breaks some of the water which they obtain from the soil and the carbonic acid gas which they abstract from the atmosphere into their chemical elements, and reconstructs these bricks from the old structure into a new one available for plant growth. This new substance is starch or something very like it chemically, *e. g.*, sugar or fat. A plant containing chlorophyll is, therefore, able to make its own food from the air and soil; and it may be said with equal certainty that a plant destitute of leaf-green must obtain a very important part of its food from other sources. We know that starch, sugar, oil and woody matter (cellulose) do not occur ready formed, nor originate spontaneously in nature, but only where living protoplasm has acted—originally through the instrumentality of light and chlorophyll; and it therefore needs no demonstration to show why fungi, having none of this coloring matter, always live on organized material,—that is, on what is or has been part of some other living thing.

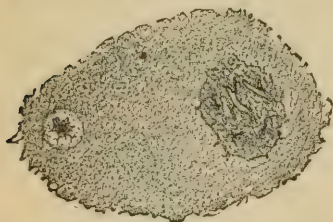
One of the commonest groups of fungi is that which includes the puff-balls and toadstools; and from what has been said it will be seen why these growths are found in well-manured pastures, on rotting wood, and in other places where organic matter is going to decay. Most of these plants are found on dead or decaying substances, but there are, unfortunately, a few exceptions to this general rule. I say unfortunately, because the only alternative is for them to grow on living matter, either vegetable or animal.



Section through a very small diseased spot of leaf, showing the fungus under the cuticle. Much enlarged.

A common sight in old orchards—far too common wherever the apple is grown—is the heart-rot or canker of trees, which, usually starting from some unhealed pruning-wound, insidiously eats into the very centre of the tree, up and down, until the once solid trunk is but a

shell, filled with powder, ready to fall before a puff of wind that would once scarcely have stirred its larger branches. This is the result of the slow but sure growth of a fungus which ordinarily lives and carries on its destructive work within the tree for years before it can be seen by the naked eye. How it lives may be shown by comparison with the well known process of cultivating mushrooms, in which, after a suitable bed of compost is prepared, bits of spawn are set as "seed." To the eye this spawn is nothing but turf or manure, traversed by a few mouldy threads; but from it the threads, which are the feeding organs (mycelium) of the mushroom, spread into every part of the bed, working over the crude, dead manure, until it is transformed into a part of their own substance, when they suddenly develop the growth that we prize for our tables. So, when a branch is cut from an apple tree, and the wound fails to heal over, a spore or reproductive cell, exceedingly minute, falls upon the wound and develops a mycelium in the healthy wood, on which it feeds until it has effected its work of destruction. Sometimes years pass before it shows itself in any form other than this microscopic growth; but ultimately, in some sorts of canker, it fruits in a form visible to the naked eye.



Scabs on Apple. Natural size.

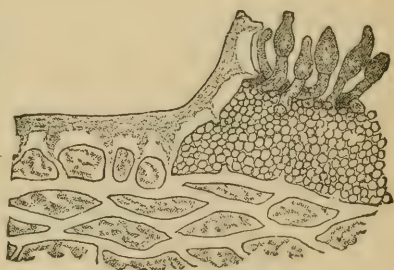
Another common fungus of the apple, but one very unlike the toadstools, is that (*Fusicladium dendriticum*), which has attracted much attention of late years as the scab and leaf-mildew. To sustain its own life it needs the nutritious substances elaborated by the leaves, nor does it hesitate to freely take them; leaving the twigs weakened, to make a spindling, sickly growth, if they succeed in growing at all, as the season goes on, and with so little vitality that a severe winter, like the last, is fatal to them. The gnarled, cracked and blackened Snow-Apples that, alone, can be raised in many localities, testify with equal force to the destructive power of the same parasite when it seats itself upon the young fruit.*

Many orchards are affected by a white mildew that appears on the young leaves or, more especially, on the twigs. When in its most vigorous summer growth, like the mildew of the rose or the verbena, it well deserves this epithet, which, however, is less expressive than the German word that it corresponds to. Mehlthau—meal-dew aptly expresses the mealy appearance of the diseased parts, which are covered

*This fungus is discussed at some length in the Report of the Wisconsin Experiment Station, for 1883, from which the accompanying figures are copied.

by a dense white mycelium from which very many minute spores fall in the course of the season. This Apple mildew (*Sphaerotheca castagnei*) is more injurious than many of its relatives, since it does not confine its attacks mainly or entirely to the leaves, but settles at once on the twigs, which dwindle and die under its baneful influence. Like the other true mildews, this forms its snowy spores only during the open season, their place being taken, as winter approaches, by another sort of fruit, visible to the naked eye as small black dots, in which resting-spores are formed, capable of surviving the winter and further propagating the disease the following spring. Accurate observations on this parasite and its work and the results of experiments with sulphur, properly made kerosene emulsions and other substances destructive to it are much to be desired.

If time permitted, attention might be drawn to a considerable number of other fungi that live on the apple; some causing disease and death, others merely living on the dead portions, which they cause to decay. No less than thirty-one such species have been enumerated by an Austrian botanist. I think, however, that while this paper is of necessity very incomplete the subject has been carried far enough to show what some of the things we know as fungi are, and why, when they live as parasites on cultivated plants, they are as destructive as experience shows them to be. Knowledge of these minute beings is still in its infancy, and can be advanced only by the most painstaking scientific investigation, supported by intelligent observation and experimentation on the part of those who feel the need of such knowledge and will profit most by it. Let us trust, therefore, that in its pursuit the practical man and the scientist may join hands in harmonious work tending to the solution of these problems in which both are interested.



Section through edge of Apple-scab, showing the fungus in the epidermal cells. Much enlarged.

On motion the meeting then adjourned till 9 o'clock Thursday morning, June 25.

SECOND DAY.

THURSDAY, JUNE 25, 1885.

The meeting was called to order on Thursday morning at 9 o'clock, by President Smith.

REPORT OF THE SECRETARY.

Mr. President and Members: Since our last annual meeting we have been occupied a good deal of the time in the preparation and publication of the annual report of the transactions of the Society for the current year.

Necessarily this work has required time and attention. It scarcely need be said that much care has to be bestowed in the preparation of the copy for the printers, revising the same and the reading of proof.

The work of printing our reports was performed expeditiously and in a very satisfactory manner, the typographical execution of the same reflecting much credit upon the State Printers, the Pioneer-Press Company. If future publications shall be as well executed no reasonable ground can be found for complaint in this regard.

There was a delay of some three weeks in the issue of the present volume, as the last few pages were about going to press, from a failure in the supply of paper, which was this year furnished by the State.

We are pleased to note that the number of typographical errors in the work is not large, thanks to the pains-taking care bestowed by proof readers and pressman. There is certainly nothing so annoying to a careful reader as to see page after page disfigured with numerous errors which might easily have been avoided.

Owing to the compilation made in 1873 of the reports of previous years, this is the thirteenth report issued by the Society. It contains a few more pages than any preceding number but is still within the limit allowed by the law authorizing our publications. It was not deemed desirable by the members of the committee on publication and your Secretary to unnecessarily enlarge the size of the report, but it was found to be impossible to make a really creditable showing of the plans, work and discussions of the Society, together with a judicious selection of material of interest to horticulturists generally, without somewhat enlarging the size of our publication.

Our report certainly makes a very creditable showing for the Society and will compare favorably with those issued by similar societies in

our sister States. The volume will be found to contain fully as much original matter as the average of their publications, and as to its merits we will let it speak for itself, as comparisons might seem "invidious."

It should be the constant aim of the Society to improve its annual reports from year to year. As its members become more thoroughly informed, gain experience and learn more of the practical requirements in the varied departments of horticultural work, as pertaining particularly to Minnesota, they will the better be prepared to impart this knowledge, thus enlarging their means of usefulness, and the scope of their influence.

Aside from the routine report it will be seen by a casual examination that our field of investigation has taken a somewhat wide range, while at the same time many topics of a timely and interesting nature have not been considered, or even referred to. It will be the province of the Society to bring up some of these matters for profitable discussion and consideration in the future. But we will not detain you longer at this time with any extended remarks.

The following letter was then read:

REPORT FROM MURRAY COUNTY.

BALATON, May 5, 1885.

Dear Sir: Yours of May 2nd, 1885, came to hand yesterday. Am sorry to have to say that we have no Horticultural Society in our County, though I believe you think me to be a resident of Lyon County. My post office is Balaton, Lyon County, just over the line between Murray and Lyon. I am three miles from the county line and in Murray County. I am quite sure they have no Horticultural Society in Lyon County. They have a live Agricultural Society and with a little waking up could keep up a live Horticultural Society in that County. As to our County I shall make an effort to have a society organized here this summer.

The few trees I have here have gone through the winter in very good shape. That is, the Duchess, Wealthy and all the crab varieties. My raspberry canes were dead down to the mulching, all varieties, even the Turner; but they were young plants. My plum and cherry trees are all right, I think. What I have said applies to the country around here. If we succeed in organizing a society I shall be very much pleased to report list of officers. With best wishes for our State Hor-

ticultural Society and those who by their untiring aid and support are keeping it up, I am,

Yours Truly,
C. F. NORWOOD.

The Secretary then read a paper on small fruits, by C. H. Hamilton, of Ripon, Wisconsin, Mr. Hamilton being unable to be present.

SMALL FRUITS.

BY C. H. HAMILTON, RIPON, WIS.

Mr. President. Having been requested by your secretary, to prepare a paper for your annual summer meeting on the subject of Small Fruits, I will endeavor to give you a few practical suggestions.

Small fruits, to people who live in the country are like heaven—objects of universal desire and very general neglect. Indeed in a land so peculiarly adapted to their cultivation, it is difficult to account for their neglect, if you admit the premise that Americans are civilized and intellectual. It is a trait of a savage and inferior race to devour with immense gusto a delicious morsel and trust to luck for another. People who would turn away from a dish of Wilson strawberries with their plump, pink cheeks powdered with sugar, or a plate of melting raspberries and cream, would be regarded so eccentric as to suggest an asylum. But the number of professedly intelligent and moral people who ignore the simple means of enjoying the ambrosial viands daily for weeks together, is so large as to shake one's confidence in human nature. A well maintained fruit garden is a comparatively rare adjunct of even stylish and pretentious homes. In June of all months, in sultry July and August there arises from innumerable country breakfast tables the pungent odor of a meat into which the devils went, out of which there is no proof they ever came. The cabbage patch may be seen afar, but too often the strawberry bed, even if it exists, is hidden by weeds and the small fruits struggle for bare life in some neglected corner. Indeed an excursion into certain parts of the country might suggest that many of its thrifty citizens would not have been content in Eden until they had put its best land into onions and tobacco. Of course there is little hope for the rural soul that does not love the manna of small fruits. We believe that humanity in the main has reached a point where its internal organs highly approve of the delicious group of fruits that strayed out of Paradise and have not yet lost themselves among the thorns and thistles. Living

without books and pictures is only a little worse than living in the country without fruits and flowers. Some perhaps have the delusion that small fruits are as difficult to raise as orchards. They class them with hot-house grapes. Others think they need so little attention they can stick a few plants in hard, poor ground and leave them to their fate; one might as well raise canary birds and kittens together as strawberries and weeds. There is a large class who believe in small fruits and know their value. They enjoy them amazingly at a friend's table and even buy some when they are cheap.

A little greater outlay, and a little intelligent effort would give them an abundant supply from their own grounds. But they usually go on from bad to worse until like their neglected strawberry beds they are turned under.

Some of you would like to have a list of varieties of strawberries which would be sure to meet all the recommendations of the disseminators. But in my own experience it is an almost utter failure to find in the different varieties all the superior qualities and adaptations which are claimed. Don't be too fast in discarding older and tried varieties for the newer and untried. I will not undertake to give you any suggestions as to what is best for you to plant. But when you do undertake to raise a bed of strawberries either for your own family use or for the market, prepare your ground with great care by having it well plowed and dragged, and by enriching it heavily. By close attention and good cultivation you will be able to get the cream or the only paying crop the first year, by forcing them in this manner.

I have never seen a bed of strawberries which I really thought paid the outlay of labor by endeavoring to revive it to the vigor and productiveness of the first year; better plow them under and cultivate the land for some succeeding crop. At this time of the year our only fruit which has ripened and once more graces our tables is so pleasing to our tastes, we are liable to want to dwell too long on the subject.

But what has been said of the strawberry, one of our most popular fruits, the principles of thorough preparation of the soil, culture, etc., apply equally to the other small fruits. Like the strawberry the raspberry is well connected. It also belongs to the rose family, and by many even preferred to all others. All people seem to have a feeling sense of the spines or thorns of this plant, as may be gathered from its name in different languages, as in German "kratsbarre" or scratchberry. While it is true that the raspberry in various forms is

found wild throughout the continent, and that the ancient gardeners in most instances obtained their supply of plants in the adjacent fields or forests.

The late Mr. A. J. Downing is of the opinion that the large fruited foreign varieties are descendants of the Mount Ida Bramble, and from that locality were introduced into gardens of southern Europe. All that has been said about the thorough preparation of the soil for the strawberry applies to raspberries with a few exceptions. Certain strong-growing raspberries, like the Cuthbert and Turner, should not be over-fertilized. Some kinds demand good clean culture rather than a rich soil that would cause too great a growth of cane and foliage. But with most varieties, I consider from my own experience, there is but little danger of over enriching the ground. By planting in rows six feet apart, and three feet apart in the row, give them a thorough system of cultivation, and a vigorous application of the pruning knife. When the plant has attained the height of about two feet cut off the top, it will cause it to branch out and form a well shaped tree capable of standing up of itself. I think it a good plan to plow a furrow up to the rows in the fall as it acts as a protector. As for the varieties, I think a man is safer in giving a list of the raspberries for general cultivation than he would for strawberries.

I will name over the varieties which have proved the most hardy with me, and will name them in rotation as to the time of the fruit ripening. The Hansell has proved the most hardy of any of the reds; Waterloo and Cuthbert next. Black raspberries, the Soughean, Ohio, Tyler, earliest; and along comes the Mammoth and Gregg; all are vigorous growers and productive. I find there is a great deal which might be said on the subject of the different varieties of the strawberry and raspberry and the different modes of cultivation. But there is one other small fruit that I would not like to be guilty of not mentioning. That is the blackberry, a fruit which is strewn over many acres of our state of Wisconsin, as well as of many other states; growing wild, and from which the greater part of our supply has been gathered by the natives and others and shipped to most every town and village which could be reached. The onward march of civilization and immigration has caused the supply to diminish as well as to recede further from the prairie towns.

As to varieties, this species has also an endless variety as well as those who advertise. Many of them are varieties of great merit in certain localities and wholly worthless in others. I will not occupy

your time in relating to you my likes and dislikes of each kind which I might name. But I will give some little history of my own success and of others in the immediate vicinity of Ripon, Wisconsin. The culture of the blackberry has become one of the first, and within the last twelve years the cultivation has extended from half an acre, till at the present time you can see something over fifty acres now in full bloom promising a large crop of this delicious fruit. The Briton or Ancient Briton which is the variety cultivated here with unparalleled success, was first sent here from Wales to an amateur horticulturist and after eighteen years' trial in different localities we place it at the head of anything that has been disseminated from any part of the country as a shipping berry or as to productiveness, and as to hardiness it will compare well with anything yet introduced.

It may be called the king of the blackberry; 4000 to 5000 quarts in about an average yield per acre.

The treatment required by the blackberry can best be understood by observing where, in its requirements, it differs from the raspberry and kindred fruits. It seems to do the best on light soils that are warm and well drained. The question is often asked, shall we manure the ground? Most certainly, as the blackberry luxuriates in a good rich soil as much as a crop of corn or any other crop.

More room should be given the blackberry than the raspberry. In planting for field culture, plant in rows eight feet apart and three or three and a half in the rows (some 8 by 4 in row) which will enable you to cultivate easily. They need to be cared for by cultivating and hoeing, the same as a piece of corn. The season being favorable, you will likely find that with a few exceptions you are progressing towards a foundation or start in blackberry culture, but after the first year is passed and you have every hill well established, comes the time which is of vital importance to the fruit grower. It then stands you in hand to look after and take care of the new wood, which is your promise for the fruit crop the next year. At this stage of growth they require support and may be staked or be supported by setting a strong stake at each end of the row, and at equal distances along the row smaller stakes opposite each other, and stretching a wire on each side kept at the proper height by a nail which answers for a support to the young bearing plants and for the new shoots, which, without support, are liable to be broken with wind.

The ideal treatment of the blackberry is management rather than culture. More can be done with thumb and finger at the right time

than with the most savage pruning shears after a year of neglect. Two or three feet is considered a fair average to stop the growth; it will branch out and generally become high enough if stopped at two feet.

Here it is necessary to protect the plants. Two good men will lay down and cover one thousand hills in a day. Beginning at the end of the row, we dig away a small quantity of soil on the side of the hill with a garden fork, which is less liable to injure the roots than a spade. We step to the opposite side of the bush, and placing one foot at the crown close to the ground and the fork in the top of the bush, we push lightly with the fork, and with the foot hard enough to bend the roots, not the tops. The other man then throws on the soil, and in less time than it takes to write this the bush is nicely secured and covered, ready for a long, cold, changeable winter. When spring comes, take a four-tined fork, loosen the crust, and placing your fork under the plant, carefully raise it up and press the soil back firmly. After the row is all taken up, string your wires at once if possible, and your plants are protected from the winds.

There is much more which could be said on this subject, but I will leave it with you.

DISCUSSION.

Mr. Harris. Mr. President, I met Mr. Hamilton last winter at the meeting of the Wisconsin Horticultural Society, and we had quite a long discussion on the subject of growing blackberries and he gave me a number of good points. I am beginning to be of his opinion, that the Ancient Briton is the best. I have been growing the Snyder because I believed it to be more hardy, but it is more difficult to protect, the canes are stronger and it has more lateral roots. Mr. Hamilton recommends covering the blackberry canes by digging down to the lateral roots and bending the canes over to the ground and putting earth on them. On account of sickness last fall I did not protect mine in that way. I have the Snyder, Ancient Briton and Stone's Hardy. The Ancient Briton blossomed the most, Stone's Hardy the next, and Snyder about one cane on a quarter of an acre; Ancient Briton was full as hardy as any of them.

Mr. Pearce. Did you cover with earth?

Mr. Harris. Mr. Hamilton covers with earth; Mr. Lord also does the same. They put the protection on very loosely that they cover the canes with; the main thing is to hold them down to the ground;

it is a simple operation. I went to Mr. Lord's and witnessed the operation. Where they are covered in this way they start a week sooner and grow better than where unprotected.

Mr. Pearce. I have been growing the Ancient Briton for five years. I have lost a great many plants without covering them, but where I have covered them they have done remarkably well. The past winter is the first I have paid attention to covering as I have grown them for plants more than for fruit. But I was told a year or two ago that it was not necessary to cover with earth, and I thought I would experiment and ascertain whether that was correct or not. Last fall after the wood was thoroughly ripe I bent the canes over to the ground and laid weights upon them—a stone, chunk of wood, or earth—and this spring straightened them up and never saw a better prospect for an immense crop than at the present; so I think the covering with earth is entirely unnecessary. I tried the same thing with roses. I tried it with the Ancient Briton blackberry on different kinds of ground, in every instance they came out in the greatest perfection; they are at this time just loaded with fruit. I shall experiment further and if I find the covering with dirt unnecessary I think it will be a great improvement. They were in exposed places and they came out in perfection without any other covering whatever.

Col. Stevens. Mr. President, it is a well known fact that in the backwoods where Mr. Pearce's grounds are, the wild blackberry comes to great perfection. It is very probable that the Ancient Briton, which is no doubt, a species of wild blackberry, would do well on his grounds when they would not succeed on the open prairies. On that kind of soil where there was no protection by snow they might be destroyed. We had a communication from a gentleman in the interior of the State who has had experience with Stone's Hardy, and he stated that it grew to perfection with him and was a most hardy and valuable variety of the blackberry; the past winter they came through without a terminal bud being injured.

President Smith. There was a good deal of snow the past winter and that may have served for a protection.

Col. Stevens. Yes, and I think Mr. Pearce's grounds are favorably located.

Mr. Harris. I do not think on my place there is a necessity for covering with earth one winter in twenty; but out on the prairie I think the earth covering would be well. Down in the valley all you need to do is to get the canes down to the ground and they will take care of themselves.

Mr. Kramer. My Snyder berries froze down to the ground, and that portion which had naturally fallen down and laid flat on the ground, came out all right and the bushes are now just loaded with berries; the canes which are an inch or more in diameter are all gone, but the small limbs which were on the ground were saved.

Mr. Harris. I had a similar experience with grapes, the vines that lay upon the ground were not injured, but I did some pruning in November before the ground was covered with snow, and among those a good many vines were killed almost to the ground. That indicates that there must have been injury done before the extreme cold, before the time when the thermometer went down into the thirties below zero.

Mr. Kramer. I have grape vines, I think, four inches in diameter which were frozen clear to the ground. I have some seedlings that are good grapes, and I laid some of the vines on the ground and they are full of fruit at the present time, but everything that has been up three or four inches in the atmosphere is all gone.

Mr. Pearce. I did not make the suggestion to recommend the practice as I expect to try it a little further. I have Concord grapes that kept to perfection without covering, by simply laying the vines upon the ground.

Mr. Kramer. I think they will; the soil keeps them from killing. If they are on the ground it makes no difference how cold it is; there is where they want to be.

Mr. Pearce. I think it well for the Society to experiment on these things. I tried the same thing with roses and am inclined to think they will keep if laid flat on the ground.

Mr. Harris. I have two of the Prairie Queen rose bushes; one of them my wife asked me to take down early in the fall, and I did so; the other I did not lay down until about the first of December; that was entirely dead in the spring, while the other was perfectly sound. It ought not to have been cold enough to injure it, but I think the portions that were exposed when we had our first freeze must have been hurt.

Mr. G. S. Woolsey. That is not my experience with the rose bush. I have prairie ground and the snow blows off; I cover the bushes and in the spring take them out and they are bright and clean; where they are exposed they are bright but dead.

Mr. Elliott. My experience in covering is this: whenever we get plenty of snow that will ordinarily cover them and keep them from

freezing, we do not have any trouble, if you only lay a few boards or sticks over them, but if they are in exposed positions where the snow blows off, your vines or bushes will be more or less injured. I think the proper way is to lay them down and cover them with sawdust, just enough to keep them from getting exposed; I think that is the surest plan. I have adopted it with raspberries and roses and it has been a perfect success this year, at any rate.

Mr. H. H. Young, of St. Paul, being present, was called upon to read a paper. He stated that he had been unable, from a press of other duties to complete a paper in time to present it at the present meeting, but would prepare a paper for the Society.

Mr. Harris moved that Mr. Young be requested to complete his essay and furnish it for publication in the transactions of this Society. Carried.

FRUIT REPORTS.

Secretary Hillman presented the following report:

Mr. President and Members: We desire to offer a few suggestions which have come under our observation, in regard to the present condition of fruit trees.

On the first day of the present month of June, we had the pleasure of visiting the orchard of a worthy member of our Society, namely, Vice-president Dartt, at Owatonna, and will give a brief description of what we saw while there.

Mr. Dartt has a very pleasant and inviting location, and for many years has taken great pains in caring for his orchard and nursery stock. Upon inquiry he assured us that the prospect for a fruit crop this season was not encouraging, as the past winter had been much more disastrous to the trees than he had at first supposed. He said that he was not disposed to despair entirely of success at fruit growing, and would continue his efforts in this direction. He expressed grave doubts, however, of the successful and profitable growth of standard fruits, and intimated that he should rely more than ever, hereafter, upon the crab and Hybrid varieties. He said further, that the past winter had been the severest he had ever experienced in this State, that a majority of his standard trees were more or less injured to the snow line. In proof of his assertions and conclusions Mr. Dartt invited us out to take a stroll through his somewhat extensive orchard and nursery grounds. On first going into his garden, we were shown a fine specimen of Hybrid seedling of Mr. Dartt's own propagation, a thrifty ten-

year old tree, then in full bloom, and apparently uninjured. He stated that this variety was grown from a Tetofsky seed, probably crossed with the Hyslop crab, the fruit of which it resembles somewhat, both in size and general appearance. This same variety stands well in the nursery, the trees appearing thrifty and showing very slight injury. We noticed here a large Duchess tree which had been utterly ruined by the protection afforded from a building which stood on the north side of the tree; from which he concludes that any protection from the north is worse than none at all.

In the orchard we found Yearl's Winter, badly affected. He remarked that it had heretofore given considerable promise as a hardy winter seedling, but he now regards it as worthless, and should never again recommend it to favorable consideration.

In his orchard of Duchess and Tetofsky, of seven or eight acres, most of the trees show marks of injury. The larger portion of the Duchess trees have been set some fourteen years, proving heretofore hardy and productive, while now many of them are killed outright and others are so much injured that they cannot fully recover. His mode of culture has been to plow the ground between the rows spring and summer, manuring or mulching heavily near the body of the trees as a protection from the cold. He regards the Duchess and Tetofsky as the only well known standard varieties worth cultivating in this climate; although a few of the Russian varieties promise equally well, others are more or less injured.

With Mr. Dartt quite a number of the crab varieties are apparently hardy and will produce fair crops of fruit this season. The best of these are Early Strawberry, Transcendent, Orange, Beachs Sweet and Hutchinson's Sweet. Whitney No. 20 is a good deal injured, or semi-hardy. As the Transcendent blighted in former years, he had, he said, on the recommendation of the State Horticultural Society, planted the Haas quite freely, but the experiment had proven abortive. The Greenwood crab seems to be a promising variety, fruit of good flavor, size of the Transcendent, the tree a constant bearer and very hardy. The Peach apple is also a hardy tree but a shy bearer. He favors the crab family generally, but says many varieties are good for nothing. The Maiden Blush, for instance, is an early bearer, a good apple, but the tree dies early; the same with Minnesota. Hutchinson's Sweet, a very fair sweet apple, is a poor bearer.

Mr. Dartt also has a young orchard one mile distant from the city, containing some three thousand trees in which he had set five hundred

Duchess this spring. He considers this variety our main dependance for standard fruit, at least for the present. His Wealthy trees, both in orchard and nursery, were pretty nearly all killed to the snow line; hence he does not recommend them, and will plant no more of them.

On the third of June we visited the orchard and nursery of Vice-president Sias, at Rochester. But as he is present we prefer to have a report from him in person.

Mr. M. W. Cook, of Rochester, informed us that his trees were badly injured by the past severe winter, but he gathered consolation from the fact that in Missouri, from which State he had recently returned, the fruit trees had been nearly all destroyed from the severity of the past winter; an illustration, perhaps, of the adage that "misery loves company."

We also met Mr. F. K. Phoenix, of Delavan, Wisconsin, at Rochester, who reported sad havoc to the trees of that locality, especially with the so-called Waupaca Seedlings, among which is the Wolf River, or Alexander. He expressed the opinion that hardy new seedlings must be sought out as our chief dependance for apples in the future, both of Russian and native varieties.

Mr. A. W. Sias, of Rochester, was then called upon and presented the following report:

OUTLOOK FOR FRUIT.

Mr. President and Gentlemen of the State Horticultural Society:

Perhaps there is no being more commonly and grossly misrepresented than the Supreme Being of the Universe. Just after the winter of 1872-3, a preacher of the Gospel said to me, "Well, Mr. Sias, the Lord has killed all the fruit trees, but it will be just as well for *you*, as they will buy and fill right up again." It perhaps did not occur to him, that it would bother me to furnish live trees to fill up with, in a country where they were all dead. And further, that if I shipped them in from a more southern clime, that *others* like *himself* would have too little confidence in the pleasure that the Ruler of the Universe is said to have in "giving good gifts to his children," to purchase so extensively as to make it as well for me as before. Another man said to me on the street at Rochester, not long ago, that "the fruit trees in the country were all killed—wood literally killed to the bark." This is true as far as the wood of the Duchess is concerned in southern Minnesota, and a most severe test of my doctrine that a "Black hearted

tree" is not wholly worthless. Providing the Duchess matures any considerable amount of fruit this season, then we are all forced into the knowledge that a "black hearted tree" is sometimes valuable, and also into the old doctrine that "a tree is known by its fruit."

During the last two or three years the fruit grower of our part of the State has had many trying obstacles to contend with. July 21st, and then again August 21st 1883, we were visited by the two most destructive tornadoes ever known since the first settlement of the State, which killed many trees outright and badly injured many others. Anything that lessens the vitality of our trees appears to increase the number of insects. The same as in the animal kingdom, before life is fairly extinct, insects assert their claim, and take full possession immediately after. I am of the opinion that in the wake of these tornadoes over one-half of the fruit has been literally destroyed up to this date, by insects of various kinds. The need of a competent State Entomologist is imperatively demanded.

Now for the bright side of this subject. We are told that every family upon the face of the earth were drowned, at one time, except one. An innumerable host is the result of this one family. In like manner, if the past winter had killed all the fruit trees but one family, from that we would soon replenish the earth, but thanks to a kind providence we are driven to no such straits as this. We find among the Russians, the Anis, Transparent and some other families that came through last winter almost unscathed. Also many native seedlings just as sound—I refer here more particularly to the seedling hybrids. Many Wealthy trees were killed in some locations, still I continue my faith in it for good locations, and on the whole I see no good reason for discouragement. The De Sota, Minnesota, Quaker, Wild Rose and Weaver Plums, never looked better. Small fruits are looking splendid.

Mr. Smith inquired if Mr. Sias had seen the Brett seedlings this spring.

Mr. Sias. I have not; I have seen the owner of the trees and he stated that they were apparently uninjured.

REPORT OF J. S. HARRIS, OF LA CRESCENT.

I have no written report, but I merely wish to state that in the last twenty-nine years, that I have spent in Minnesota, the last one was the most disastrous of any to fruit trees. The St. Lawrence trees that I set out twenty-nine years ago are badly whipped; also the

Wealthy; so much so that but two trees on my place will bear this year. The old varieties which produce such fine fruit, which I used to exhibit at our fairs are practically dead, and it don't seem possible that they can recover. I have had some Russian varieties a short time and have four or five that are not injured to any serious extent. The Duchess is not seriously injured; last year's growth was killed back some two inches. I am not, however, entirely discouraged; as soon as I found out the injury that had been done to my trees I resolved to go on again, and I shall continue my efforts in trying to grow apples in Minnesota. The very difficulties we have to contend with are going to help us the sooner to get a hardy variety. We have met with reverses, and every time it seems to be worse. But I tell you we are going to raise our own fruit, and have enough and to spare; we are going to find Russian varieties, I think, that are hardy; we may not find them adapted to all seasons of the year and every portion of the State; but, we are going to keep planting until we get what we are looking for.

Small fruits in our part of the State are doing well, especially strawberries and grapes. Raspberries in places were killed down to the snow line, which means ordinarily, within three inches of the ground. Blackberries were also killed that were not protected. Everything seems to be favorable for fruit. I find much interest manifested among those who have been growing fruit long enough to raise it and they are replanting and carrying on the good work. I saw one man who had been growing trees for twenty-five years who wanted to buy some trees and when I showed him the dead trees, he said he should plant more of them and keep on trying. That seems to be the feeling among the members of our Society, and to my mind it indicates that we are doing a good work.

Mr. Fuller. The Transcendents which some persons have been trying to drive from our State are about the only trees that stand uninjured in our section, north of the Big Woods; that stands very well. The wood is colored a little as is nearly every fruit tree in Minnesota; but it looks healthy. Usually the trees hang full of fruit. Next to the Transcendent in hardiness is the Orange; Minnesota and Beachs Sweet stand pretty well. Hutchinson's Sweet as a tree is hardy but does not bear any apples and I dug up the last of mine this spring. Whitney's No. 20 is hurt some but not very badly. I received about twenty Russian varieties a year ago from Professor Budd. A part of them killed to the ground and a part of them stand. I have a seedling

crab which is the least colored of anything I have seen—probably a seedling of the Transcendent, and the fruit a little larger; probably not much more valuable if any, than the Transcendent. Small fruits are all one could expect. We can do nothing up there with blackberries, except by laying them down. Raspberries were hurt a good deal. Currants, gooseberries and strawberries are a very fine crop.

Mr. Kramer. Mr. President, I had a letter from the Secretary asking me to give a report of my seedling apple trees, and as I had no time to write I thought I would not make him the trouble to read my poor writing or write it all over again for me. So I was induced to come up myself and I will give you the report so far as I can. I sent the Secretary this spring some specimens of my seedling apples. I generally think that one can tell more by the taste than by the looks what fruit is good for. I have been sowing seed for a good many years and have received a good many apples, but must say to you that the nicest ones are entirely gone I think. Three or four trees are coming out, I won't say all right, but within the last two weeks have commenced growing and I think will recover. I have half a dozen younger trees that look well; some of the shoots have grown a foot and a half. They were hurt worse than I thought at first. Of the older trees there is not one that has recovered except the crabs, and the Duchess and Tetofsky, of course; the crabs I don't call apples. It is our duty to go on and try again; if one tree kills out we should set another and after awhile we will succeed, that is if we all try. If we plant the good seed, as the scripture says, the same with the apple as with the strawberry, we will have an apple and a strawberry for our use after awhile. The older trees are all gone, and we can't depend on the Duchess and Tetofsky. The apples don't keep long enough; they only keep long enough to take them from the tree into the mouth, and that is the last of them. We must try and find something better.

Mr. Pearce. I would like to say one word in regard to a fruit report. I don't suppose there is anyone more interested in fruit growing in the State than I am. I had as fine an orchard as anyone and had about 4,000 trees and which I valued at five dollars a tree. Fully two-thirds of them are virtually dead and the prospect is not encouraging. At the same time those trees, many of them, will recover and produce fruit. They are reviving and I find that young shoots are coming up which in three years will bear fruit. I have probably 200 seedlings and nearly that many varieties. Among them I have one variety of excellent quality that fruited last year; it is early and

one of the best. It received the highest premium at the fair. The tree is green to the very top and not a bud was injured. I have several other varieties, not injured a particle, as well as several Russian varieties. We can graft upon these young shoots and we will soon have a better orchard than ever. Where my Wealthy trees died I shall graft with varieties that I know will stand, and if my life is spared three years my loss will more than be made good. We need perseverance and determination when we fight against the elements. The Almighty has given us a mind that is capable of endless improvement, and we can surmount all these difficulties, but if we submit and become discouraged we shall fail. .

Mr. Kramer recommended growing trees from the roots instead of the ordinary method of grafting.

Mr. Sias said a very good way to graft trees was by budding.

Mr. Kramer. This is not alone for the nurserymen. I have an interest in this myself. I do not see any use in budding or grafting the way they do it. The cion from the tree does not start to grow in that way, it comes from the root. You take the roots and you can grow your trees from them; keep them from freezing in the winter and in the spring they will start out and come right ahead; so that in May you will have a tree that you can set out and will make a good growth the first year. What is the grafting for? You take the roots from one tree and put another piece of wood on to it; why don't you take the root and set that out? You would not take a part of one child and put it upon another, to make two children. [Laughter.]

Mr. Harris. One advantage from Mr. Kramer's method of propagating is probably very poorly understood by the mass of people. One difficulty in grafting with cions is caused by an imperfect union which causes injury to the tree. It looks reasonable to conclude that a tree upon its own roots will grow the most natural, and it will undoubtedly grow more rapidly and be longer lived upon its own roots.

Mr. Sias. If I understand Mr. Kramer's idea, it is to propagate from the roots, which is probably the nearest approach we can get to a seedling; it would naturally be a longer lived tree than a grafted or a budded one.

Mr. Kramer. If you take these sticks in and keep them through the winter they will naturally heal over; you set them out and the upper end is unhealed. In time the warm weather comes and causes the roots to start. It is the simplest to grow your trees in the way I have stated.

CONGRATULATORY TELEGRAMS.

Mr. Harris stated that the Wisconsin State Horticultural Society was now in session, and moved that the Secretary be instructed to send a telegram of greeting to the Society. Carried.

The Secretary sent the following telegram:

MINNEAPOLIS, June 25.

Minnesota State Horticultural Society in convention assembled, sends greeting to the Wisconsin Society. A grand display of strawberries, and members are enthusiastic.

S. D. HILLMAN, Secretary.

REPLY.

Later in the day the following reply was received;

“WEYAUWEGA, June 25.

Wisconsin Horticultural Society in session with the Weyauwega Society, receive greeting from the Minnesota Society and return the same. Come and see our Wolf River apples.

B. S. HOXIE.”

LETTER FROM PROF. BUDD.

The following letter was received from Prof. J. L. Budd of Ames, Iowa, under date of June 23:

Mr. S. D. Hillman—My Dear Sir: I have just returned from the nurserymen's convention at Chicago. I find that the old sorts of trees are mainly dead through to Lake Michigan; only the Russians and the crabs are really alive at Waukegan, Ill. My old forty-acre orchard in Benton county is wholly dead, except Duchess, Wealthy, Plumb's Cider, Gros Pomier and the crabs, and all except the Duchess and the crabs are sadly hurt. It will pay the State of Minnesota to send a man to Eastern Russia to forward cions. Any variety of apple, cherry or plum doing well in the province of Limbursk and Kazan will live with you as well as box elder. But many of the sorts of Central and Western Russia will fail to stand your test winters. It is impossible to get cions or trees from Eastern Russia without being on the ground. If packed there by inexperienced parties without moss—there is no moss there—they always get used up by their four months' voyage.

We are most anxious to get the varieties of the black soil sections of Central Russia, say of Oreal and Varouesk, and for Southern Iowa down to Koursk.

Yours,

J. L. BUDD.

THE LEAF-ROLLER.

President Smith. One of the objects of our summer meeting is to discuss small fruits. There are many insects which prove injurious to small fruits and I would like to have the experience of some of those present in regard to the leaf-roller, which has done a good deal of damage in some sections.

Mr. Oliver Gibbs, Jr. being called upon came forward and said:

Mr. Gibbs. About all the information I could give you is as to the destructive character of the pest, and so far as that is concerned I think you already have about all the information you want. I had experience with the leaf-roller two years ago; they were all over my strawberry beds and I had three or four acres planted. On one-half acre they destroyed the whole crop. I mulched my strawberries with fine straw taken from an old ice house. In the spring I noticed very early that the birds were digging over that straw. I examined and found where they had searched for these insects, going some six inches down in the straw sometimes. The following season I discovered hardly any signs of the leaf-roller, and I think the birds took them. I do not know of any artificial remedy whatever. It is the most destructive pest I think, that ever infested strawberry plants.

Secretary Hillman here referred to remedies recommended in the report of the Missouri Horticultural Society, exterminating the leaf-roller by mowing and burning the leaves in mid summer, etc.

Mr. Busse. Do they deposit their larvæ in the ground in the spring?

Mr. Gibbs. The insect hatches out in the spring and is about a sixteenth of an inch in length, and commences its work after warm weather begins. It weaves a web consisting of little bars, across the stem or leaf of the plant, and the leaves commence to fold together. It weaves its way along until the leaf is entirely folded together and after it is closed no poison can touch it unless it is strong enough to kill the plant. Ordinary solutions of Paris green have no effect. It has been said that the burning of the fields in the fall or spring has proven of benefit. I think Prof. Forbes reported to our Society that they had tried it in Illinois and it was the only effectual remedy they had ever used. The worm changes its form and becomes apparently lifeless; it eats its way through the leaf, drops off and buries itself in the rubbish or mulch on the ground. There seems to be a period when it lies among the vines or rubbish, when they can be destroyed by burning; but if not destroyed it remains near the surface of the soil and comes out in the spring. Of course it changes its form to a fly

which deposits eggs which in turn are hatched out, thus performing the various evolutions of insect life.

Mr. Busse. Some three weeks ago I noticed small worms upon my plants that were very numerous and I thought perhaps they were the leaf-roller, but they were much smaller.

Mr. Gibbs. This insect when in the form of a pupa eats holes through the leaves. Here is a leaf which has one of the insects inside. You can see it by opening the leaf. [Illustrating.] There he is, a very lively little delegate; if you are going to catch him, you have got to be spry.

Prof. Porter. In reference to the leaf-roller, I would say that I have had a little experience which may be of interest. Two years ago this last winter I had a very fine bed of Wilson's Albany, Glendale, Crescent Seedling and Minnetonka Chief; they were in very fine condition and growing in hills. I mulched the plants; the rows were four feet apart—plenty of room. As the ground was very light or sandy, I thought I would mulch heavily with well-rotted manure so as to protect the plants through the winter. In putting on the manure the outer edges of the bed were not covered. The next spring as soon as the plants began to develop I found the leaf-roller on every single plant, so thick in the body of the bed that the plants were all destroyed; in the outer borders where the mulching had not extended, there were very few insects, and the plants were alive and vigorous while all the rest of the bed of plants was entirely destroyed. Last spring I commenced an investigation of the habits of this leaf-roller. Not knowing that the subject was coming up for discussion I did not bring my notes with me; but this fall, at the State fair, I will show you there the insect in all stages of development; I have them prepared and mounted, but have not the notes of the examination with me.

THE UNIVERSITY EXPERIMENTAL FARM.

Mr. Busse. I understood that we were to have some remarks from Prof. Porter about what he is doing on the Experimental Farm.

Prof. Porter. Gentlemen; this Society is one of the associations of the State, which is entitled at every annual and semi-annual meeting to a report of what is being done at the University Experimental Farm.

You are well aware that five years ago when I took charge of the Department of Agriculture at the State University, I found it in

possession of a farm of 120 acres, within the limits of the city of Minneapolis. At that time, I was a stranger to the soil, a stranger to the climate of this State, and a stranger also to its wants. I contented myself the first year with carefully looking over the grounds and taking notes. I found at the end of that season that we had a farm totally unsuited for the purposes for which it was designed; there were not two acres of ground in the whole 120 acres contiguous to each other, of the same quality of soil; there was not one-fourth of the 120 acres that would bear the weight of a horse; you could jump up and down on three-fourths of it and shake the surface for a distance of fifty feet around you. [Laughter.] It was either a quagmire or a sandhill. In addition to this, it was unfavorably located. It was contiguous to our city; it was being surrounded by the great improvements which are being carried on in our rapidly growing city of Minneapolis; it was being cut up by the great lines of communication between St. Paul and Minneapolis, and I saw that in the course of a few years more it would be totally unsuited for our wants, even though the soil was suitable for our purpose. I therefore condemned it as being unfit for the purpose of an experimental farm. The Board of Regents authorized me to make any selection of any farm in the State of Minnesota, that I thought would be suitable for our purpose. I had in the meantime been examining different localities, and particularly the situation of a farm midway between Minneapolis and St. Paul, the first purchase embraced 155 acres and at the close of the first season we purchased about 100 acres more. This land adjoins the new State Fair Grounds, and is most conveniently located on Como Avenue. It contains within its enclosure every variety of soil that can be found in this country—from a brick clay on the one side to drifting sand on the other. A portion of it is just as fine a soil as can be found on the face of the globe—all that we need; and we have got just as little poor soil as can be found within the limits of our State. We have on that farm every exposure, north, south, east and west; we have lakes and meadows, hills and prairies; we have everything that is desirable excepting running water; but we cannot find all the advantages in one place. We suppliment that deficiency by sinking a well 170 feet deep and throwing water, by the use of a windmill and by power, on to an elevation that enables us to distribute water over every foot of the ground and on the top of every one of our buildings.

This land was purchased, and two years ago this spring I took possession of it and commenced the erection of our farm buildings.

We have not completed all our buildings, but we have two main buildings up, the farm house, its offices and appliances, and the farm barn. I pronounce both of them the best buildings of their kind in the United States; I challenge contradiction and examination. We have not yet completed the barn, but the work is now going on; I found the farm had been run continuously in wheat and oats ever since it was taken up by the first settler. I took off last year the nineteenth crop of continuous grain, there was no grass of any account upon the farm. Now we have about one hundred and sixty acres seeded down that will yield two and one-half tons of hay to the acre. A good deal of it was in black oak grubs, and a portion of it so thickly filled with underbrush that a bird could scarcely pass through it. There was not a panel of fence in good condition on the farm and all the line fences were covered with underbrush. My work thus far has been mostly foundation work; in the first place to get our hedge rows cleaned out to get the ground fitted for cultivation; grubbing, plowing and seeding down to grass, and to prepare it for keeping stock; to get our farm buildings erected and get in condition for experimental work. I found the fields completely overrun with everything that was vile and noxious to the farmer. One year ago in passing through the fields on a portion of the place, you could not tell whether we were growing oats, wheat or wild mustard for a crop, but the wild mustard predominated. Our fields were so filled with wild mustard, with wild peas, with wild oats, that we could not grow a single bushel of grain fit for seed purposes. Now, we have commenced a system of improvement. Our fences are not yet up, but we are ready for them. I have been preparing the ground in the first place. As I said, our buildings are nearly completed.

We are just ready, really, to commence our legitimate work of illustration and experiment work. Every department of agriculture and horticulture is expected to receive a proper proportion of attention. You are interested of course to know what we are doing in horticulture. I have commenced this season for the first time the putting out of our fruit plantations. I have in our orchards and nurseries, this season, the entire collection of Russian varieties furnished by Prof. Budd, in all, 197 varieties. I have established a Russian orchard; of trees as yet, I have only seventy varieties. Prof. Budd could not furnish me trees of suitable age of more than about seventy varieties. I have two acres and a half devoted to these Russian apples. The trees are all two years old, and I have lost but two out of the entire number. I sent one of my young men down to Prof. Budd's nurseries in March,

and he selected under the direction of Prof. Budd, cions of everything that he had brought from Russia, and that he had received since his return. I have over 5,000 of these root-grafts now planted, and I find from an examination made yesterday that about seventy-five per cent. of them are going to live. The work should have been done much earlier in the season. I have over 3,000 of these root-grafts growing, and in the course of another year I shall be able to distribute from this nursery to our horticulturists throughout the State enough for testing purposes; I propose to furnish duplicates to your different experimental stations whenever they are ready to receive them. In addition to this line of work I have not only all the fruits, embracing his apples, pears, plums and cherries, but I have a large list also of ornamental shrubbery and trees that Prof. Budd found growing the most luxuriantly, or successfully, in the same climate as that of our northwest, where they have the same average temperature, the same degree of humidity, where there is every reason to suppose we should have the same degree of success; if they can grow these ornamental trees in Russia I don't know why we should not succeed equally as well in Minnesota.

In addition to this work I have planted an orchard of four acres of our most approved Minnesota apples for fruiting purposes. I have four varieties of pears that Prof. Budd found to be perfectly hardy in Russia which are hardy at Ames, Iowa, and which he recommends for Minnesota and Dakota. We will give them a test and another year we will be able to make a report on them. Of Russian plums I have only one variety; I had four specimens, but have only one of them living. Of the native plums of Minnesota we have a collection of the best varieties, etc. I have of the grapes, twenty-two varieties; they have all come through the winter in fine condition, and will be ready for fruiting next season.

In the line of small fruits, I have a large number of varieties of strawberries, raspberries, currants and gooseberries. They are all well established and making a good growth. In the line of vegetables I have growing this year about every thing that can be grown in the State of Minnesota, and in condition may be ranked as good, bad and indifferent. Some of these varieties of vegetables are doing remarkably well; some of them owing to defective seed, are looking very poorly. I can report one crop that is vigorous wherever it has had a chance, and that is weeds and grass. [Laughter]

Now, in our work in horticulture I wish to place the Experimental

Farm in full accord with this Society; I wish to receive the suggestions of its members as to any of the lines of experimentation that they wish to have employed and carried out.

Every member should have a deep interest in the success of this Experimental Station—it is yet in its infancy, and will need all the support and encouragement you can give it, but by such assistance we can make it worthy of our Society, our State, and its grand resources.

The Judges being ready to report, the following award of premiums was then read:

AWARD OF PREMIUMS.

STRAWBERRIES.

Best general collection of five named varieties, George S. Woolsey, Minneapolis, first premium, \$5; J. C. Kramer, La Crescent, second, \$3; best four varieties, Wm. Lyons, Minneapolis, first premium, \$3; G. S. Woolsey, second, \$2; best three plants in pots, H. F. Busse, Richfield, first premium, \$3; Wm. Lyons, second, \$1. Largest fruit of any variety, (Sharpless), Mary E. Hintgen, La Crosse, Wis., first premium, \$2.

Minnesota Seedling—(Early Princess.) J. C. Kramer, La Crescent, first premium, \$5; Wm. Lyons, second, \$3.

Wilson—H. F. Busse, first premium, \$2; Geo. S. Woolsey, second, \$1.

Crescent—Prof. L. Asire, Minneapolis, first premium, \$2; A. W. Sias, Rochester, second, \$1.

James Vick—J. C. Kramer, first premium, \$2; Geo. S. Woolsey, second, \$1.

Manchester—Wm. Lyons, first premium, \$2; Geo. S. Woolsey, second, \$1.

Glendale—G. S. Woolsey, first premium, \$2; Oliver Gibbs, Jr., Lake City, second, \$1.

Cumberland Triumph—A. W. Sias, first premium, \$2.

Minnetonka Chief—Wm. Lyons, first premium, \$2; G. S. Woolsey, second, \$1.

Sharpless—Mary E. Hintgen, La Crosse, Wis., first premium, \$2; H. H. Dyar, Minneapolis, second, \$1.

Bidwell—John Van Loon, La Crosse, Wis., first premium, \$2.

Boyden—John Van Loon, first premium, \$2.

CURRENTS.

Stewart's Seedling—J. F. Gilmore, Richfield, first premium, \$2.

FLOWERS.

Geraniums and Pansies—Best collection, C. A. Smith, Minneapolis, first premium, \$5.

Peonies—J. T. Grimes, Minneapolis, first premium, \$2.

Potted Plants—Mrs. M. J. Hillman, Minneapolis, first premium, \$2.

Boquet Wild Flowers—J. C. Kramer, La Crescent, first premium, \$2.

Boquet Roses—G. H. Roberts, Minneapolis, first premium, \$2; Mrs. M. A. Pearce, Minneapolis, second, \$1.

Collection Roses—Mrs. F. G. Gould, Excelsior, special premium of \$3.

Remarks. The collection of Geraniums and Pansies by C. A. Smith of Minneapolis, in the opinion of the judges, is one of the finest ever displayed before the Society.

The collection of Peonies exhibited by J. T. Grimes, of Minneapolis, were hard to beat.

The potted plants shown by Mrs. M. J. Hillman, of Minneapolis, were especially fine.

The boquet of wild flowers by J. C. Kramer, of La Crescent, was "a thing of beauty."

The boquet of roses by G. H. Roberts, of Minneapolis, is just splendid.

The collection of roses by Mrs. F. G. Gould, of Excelsior, will bear close inspection—a display well worthy of imitation.

VEGETABLES.

Best and Largest Collection—J. S. Gray, Minneapolis, first premium, \$5.

Asparagus—J. C. Kramer, La Crescent, Wis., first premium, \$1; Truman M. Smith, St. Paul, second, 50 cts.

Carrots—J. S. Gray, Minneapolis, first premium, \$1.

Onions—J. S. Gray, first premium, \$1; C. A. Smith, Minneapolis, second, 50 cents.

Radishes—C. A. Smith, first premium, \$1; J. S. Gray, second, 50 cents.

Turnips—C. A. Smith, first premium, \$1; J. S. Gray, second, 50 cents.

Pie Plant—Wm. Lyons, Minneapolis, first premium, \$1; F. X. Crepau, Minneapolis, second, 50 cents.

Cabbage—Fred Busch, Richfield, first premium, \$1.

Cauliflower—J. Ostergreen, St. Paul, first premium, \$1; Fred Busch, Richfield, second, 50 cents.

Peas—Wm. Lyons, Minneapolis, first premium, \$1; G. H. Roberts, Minneapolis, second, 50 cents.

Cucumbers—Fred Busch, Richfield, first premium, \$1.

Potatoes—Wm. Lyons, Minneapolis, first premium, \$1.

Lettuce—J. S. Gray, Minneapolis, first premium, \$1; N. H. Reves, Minneapolis, second, 50 cents.

The premiums awarded seemed to give general satisfaction and were at once paid by the Treasurer. The total amount of premiums as awarded by the several committees was: on fruits, \$56; on flowers, \$17; on vegetables, \$21; total, \$94.

On motion of Mr. Fuller the following resolutions were adopted:

WHEREAS, Our State is being continually invaded by tree agents, who have some new process for making trees and shrubbery perfectly hardy, and which they will warrant to any extent desired, and

Whereas, The last hobby is budded trees, which they sell at extravagant prices; therefore

Resolved, That we recommend, as we have before, that the people of the State give no order for trees to irresponsible parties.

Resolved, That Prof. Porter be requested to prepare a paper for publication in the papers of the Northwest in regard to the comparative value and hardiness of budded and grafted trees.

Mr. Harris, from the committee on Final Resolutions presented the following report, which on motion was adopted:

FINAL RESOLUTIONS.

Resolved. That the thanks of this Society are hereby tendered to Mr. H. A. Gale for the use of this hall for our meeting; to the citizens of Minneapolis for entertainment and encouragement; to the members in attendance at this meeting, and to the various railroads that have tendered to us reduced rates of transportation. Also to Prof. Budd, Secretary of the Iowa State Horticultural Society, and to Prof. Trelease, Secretary of the Wisconsin State Horticultural Society, and other members of those Societies for papers, words of encouragement and good wishes. Also to Commissioner Gibbs, Prof. Porter and others of the Faculty of the University, and Mr. and Mrs. F. G. Gould and Helen M. Gould and all others, who were in any way instrumental in constructing the late Horticultural exhibit of New Orleans and securing for our State such liberal awards and marked honors.

Messrs. F. Augustus Conkling and E. D. Jackson, appointed a committee to examine as to the merits and to select a name for the best seedling strawberry exhibited by J. C. Kramer, presented a report recommending the name "Early Princess."

It was decided to omit the visit to the parks and horticultural gardens in and near the city.

The fruits displayed were appropriated by the committee on arrangements for the purpose of providing for the picnic dinner.

The meeting on motion adjourned *sine die*.

The *Farm Stock and Home*, of Minneapolis, under date of July 1, 1885, says:

The Summer Meeting of the State Horticultural Society, which was held in this city, on Wednesday and Thursday of last week, was a grand success. The display of small fruits on exhibition plainly indicates the rapid progress made in this important branch of horticulture. The vegetables were marvelous, and the floral exhibition was good, considering the time of the year was advanced for roses. The different matters discussed by the members were interesting and profitable. The venerable president, of the Society, Truman M. Smith, of St. Paul, gave a glowing account of the progress made in the good work under the auspices of the Society. It is evident that the members never intend to give up the ship. As often as the fruit trees are killed by the severe frosts of winter, they will "pick the flint and try again." There are several seedling varieties of rare merit in our midst that withstood last winter's inclemencies, and these will take the place of the supposed iron-clads that proved too tender for this climate.

MEETINGS OF THE EXECUTIVE COMMITTEE.

A meeting of the Executive Committee was held at the office of *Farm, Stock and Home* at Minneapolis, June 19, 1885. There were present T. M. Smith, President, J. S. Harris, J. M. Underwood, Wyman Elliot, J. T. Grimes, Treasurer, and S. D. Hillman, Secretary.

A bill in favor of the *Pioneer-Press Co.*, of \$15, for printing was allowed.

President Smith proposed his resignation, assigning a reason for this action in a failure to secure proper recognition of the interests of the Society, from the State Agricultural Society.

On motion the committee declined to accept the resignation.

On motion of Mr. Elliot the time of holding the summer meeting of the Society was fixed on Wednesday and Thursday, June 24 and 25. After some informal discussion with reference to horticultural exhibits at the State fair, etc., the meeting adjourned.

A meeting of the Executive Committee was held at Market Hall, Minneapolis, June 25, 1885, all the members of the committee being present.

A bill of \$16, of H. L. Smith of Lake City, for printing, was allowed.

Oliver Gibbs, Jr., the former secretary of the Society, presented a statement of his account, showing a balance in his favor of \$43.33, including quarterly salary, which was accepted as correct and account allowed.

A bill of \$1.55, express charges, paid by Wyman Elliot, was allowed.

On motion of Mr. Harris each official member of the Society was authorized to distribute twenty-five copies of the annual reports of the Society.

The bill of Mr. Harris of \$8.85, expenses as delegate to the meeting of the Wisconsin Horticultural Society, was allowed.

An itemised bill of the Secretary of \$43.66, was allowed.

MEETINGS OF THE EXECUTIVE COMMITTEE.—Concluded.

A meeting of the Executive Committee was held at the State fair grounds, September 10, 1885.

There were present Messrs. Harris, Elliot, Day and Pearce, of the committee, Treasurer Grimes and Secretary Hillman.

Treasurer Grimes made a statement with reference to the ruling of the State Auditor as to the use to be made of the annual appropriation of funds in aid of the Society, to the effect that no money could be set apart as a reserve fund for the purpose of paying premiums, and that the same was only available to pay current expenses, etc.

On motion of Mr. Pearce, the Secretary was directed to communicate with the Attorney General as to his opinion upon the point raised. The meeting then adjourned.

A meeting of the Executive Committee was held January 22, 1886, at Harrison's Hall, Minneapolis, all the members being present except the Secretary.

The following bills were audited and allowed:

T. M. Smith, balance on account rendered \$3.50.

J. T. Grimes, incidental expenses, 1884, \$4.76.

S. D. Hillman, balance on account rendered \$35.55.

C. L. Smith, services as Assistant Secretary, \$15.

J. S. Harris, expenses and railroad fare, \$10.

A. W. Sias, expenses as Vice-President, \$4 80.

M. Cutler, expenses as Vice-President, \$3.85.

G. W. Fuller, expenses as Vice-President, \$3.10.

Rent of hall and janitor fees, \$23.

Drayage, use of plates and fuel, \$2.75.

MINNESOTA STATE HORTICULTURAL SOCIETY.

NINETEENTH ANNUAL MEETING

—AT—

Harrison's Hall, Minneapolis,

TUESDAY, WEDNESDAY, THURSDAY AND FRIDAY,
JANUARY 19, 20, 21 AND 22, 1886.

Following is the circular sent out announcing the annual meeting of the Society:

The Program for the Annual Winter Meeting is unusually complete, and the officers of the Society feel assured of an interesting and profitable session. To this end they earnestly and cordially invite every member of the Society, as well as all others interested in horticultural pursuits, to be present and take part in the proceedings. It is hoped and expected that County horticultural societies and other kindred organizations from a distance, will send delegates and take part in the discussions. The amount of personal sacrifice made necessary by attendance upon the daily sessions will be amply repaid by the information which may be gained from the consideration of numerous practical topics to be brought before the meeting.

The public are earnestly invited to attend, especially the evening sessions, as the meetings are not exclusively for members, but are free to all. The ladies are very cordially invited.

Any person may become a member of the Society on payment of one dollar, the annual membership fee, and be entitled to receive one or more copies of the annual reports and back numbers if desired.

In addition to the usual reports of officers and the members of the various fruit committees, it is specially requested that members and others prepare short papers or essays upon practical and useful subjects, giving their experience and such suggestions as may seem timely and proper, and such as may be calculated to elicit profitable discussion and afford valuable information upon horticultural

tural topics. Useful hints may be given concerning the best and most profitable varieties for different localities, methods of care and culture; also experience as to varieties which have proven unprofitable, thus enabling others to avoid needless expense from planting inferior kinds, or those not suitable for certain localities. Reports are desired upon hardy varieties of fruit which have escaped injury the past severe winter, as well as the methods adopted to afford protection. Any one unable to attend is invited to send such notes to the Secretary. A number of papers and reports will be given in addition to the list published herewith.

Members in attendance at the meeting from a distance, will be provided by the Secretary, on application, with certificates which will enable them to return to their homes over the various lines of railway at one-fifth the regular rates, they having paid full fare coming to the meeting.

Members in attendance from a distance will be provided with entertainment by the local committee on arrangements. For further particulars address:

S. D. HILLMAN, Secretary,

MINNEAPOLIS, MINN.

TRUMAN M. SMITH, President,

ST. PAUL, MINN.

PROGRAM.

The following order will be adhered to as near as circumstances will permit, but may be varied from time to time as the Society may think best.

FIRST DAY.—TUESDAY, JANUARY 13, 10 A. M.

Opening Exercises. Arrangement of Exhibits and Reception of Members.

Appointment of Committees. On Award of Premiums; on Finance; on Final Resolutions; on Publication; on Obituary.

AFTERNOON SESSION.—AT 2 P. M.

Address of Welcome. Prof. Edward D. Porter, in charge of Theory and Practice of Agriculture, University of Minnesota, Minneapolis.

Response to Address of Welcome. Geo. W. Fuller, Litchfield.

Practical Suggestions for Horticulturists. Col. John H. Stevens, Minneapolis.

Discussion on same.

Reports from Local Societies. By Secretary Hennepin County Horticultural Society, J. E. Northrup, Minneapolis; Olmstead County Horticultural Society, M. J. Hoag, Rochester; Minnesota Valley Horticultural Society, A. B. Register, Granite Falls, and others.

Question Box

EVENING SESSION.—AT 7 P. M.

President's Annual Address. Truman M. Smith, St. Paul.

Grape Culture. Silas Wilson, President Iowa State Horticultural Society, Atlantic, Iowa.

Discussion on same.

Cross Breeding of Plants. Geo. P. Peffer, Pewaukee, Wis.

Discussion on same.

Pruning and the cause of Black Heart in Apple Trees. Dr. T. H. Hoskins, Newport, Vt.

Discussion on same.

SECOND DAY.—WEDNESDAY, JANUARY 20, AT 9 A. M.

Report of Seedling Committee. John S. Harris, La Crescent.

Discussion on same.

Russian Apples. A. W. Sias, Rochester.

Reports on Russian Apples. A. G. Tuttle, Baraboo, Wis.; Andrew Peterson, Waconia; Chas. Ludluff Carver, and others.

Discussion on same.

Miscellaneous Business. Premium List Horticultural Products at State Fair; Discussion; Question Box, etc.

AFTERNOON SESSION.—AT 2 P. M.

Ad Interim, or District Reports, by Vice Presidents of the Society: A. W. Sias, Rochester; E. H. S. Dartt, Owatonna; M. Cutler, Sumter; F. G. Gould, Excelsior; G. W. Fuller, Litchfield.
Discussion on same.

EVENING SESSION.—AT 7 P. M.

Music by Glee Club.
Some Fungous Diseases of Small Fruits. Prof. A. B. Seymour, Wisconsin State University, Madison, Wis.
Also, Suggestions upon Grape Rot, Pear Blight, Spot Disease on Strawberries, etc., Prof. Seymour.

Music by Glee Club.
Climate and Horticulture. Prof. D. R. Maginnis, Northfield.
Aesthetic Features of Horticulture. H. H. Young, St. Paul.
Music.

THIRD DAY.—THURSDAY, JANUARY 21, AT 9 A. M.

Annual Report of Secretary.
Annual Report of Treasurer.
Training and Pruning the Grape. Samuel Doughty, Lake City.
Grape Growing at Minnetonka. A. W. Latham, Excelsior.
Discussion on same.
Humbugs in Horticulture. M. Cutler, Sumter.
Success and Failure in fruit growing in the Northwest. F. G. Gould, Excelsior.
Correspondence, etc.
Question Box.

AFTERNOON SESSION.—AT 2 P. M.

Horticulture on the University Experimental Farm. Prof. E. D. Porter, Minneapolis.
Discussion on same.
Orchard Management. M. Pearce, Minneapolis.
Discussion on same.
Report of Finance Committee.
Report Committee on Districting the State. J. S. Harris, Chairman.
Annual Election of Officers, by ballot.
A complete Farmer's Garden. J. S. Harris, La Crescent.
Question Box.

EVENING SESSION.—AT 7 P. M.

Music by Glee Club.
Floriculture as Related to the Adornment of School-grounds. Mrs. C. O. Van Cleve, Minneapolis.
Fruit Culture in Southern Dakota. Mrs. Laura A. Alderman, Hurley, Dakota.
Entomological Report. Prof. N. H. Winchell, Minneapolis.
Some Notes on the Biological Aphidæ, or Plant Lice. O. W. Oestlund, Assistant on Minnesota Geological and Natural History Survey, Minneapolis.
Discussion on Same.
Music.

FOURTH DAY.—FRIDAY, JANUARY 22, AT 9 A. M.

Reports from Experimental Stations:

PROF. E. D. PORTER, Minneapolis.
M. PEARCE, Minneapolis.
A. W. SIAS, Rochester.
F. J. SCHREIBER, Moorhead.
CHARLES LUDLUFF, Carver.
B. TAYLOR, Forestville.
E. H. S. DARTT, Owatonna.
J. H. BROWN, Lac Qui Parle.

PETER M. GIDEON, Excelsior.
G. W. FULLER, Litchfield.
R. M. PROBSTFIELD, Moorhead.
ANDREW PETERSON, Waconia.
UNDERWOOD & EMERY, Lake City.
FRED VON BAUMBACH, Alexandria.
L. E. DAY, Farmington.
J. S. HARRIS, La Crescent.

Report of General Fruit Committee:

SIDNEY CORP, Hammond.

D. K. MICHENOR, Etna.

CHAS. BRENDERMULE, Moorhead.

C. E. SHANNON, Granite Falls.

O. F. NORWOOD, Balaton.

M. C. BUNNELL, Newport.

J. N. STUBBS, Long Lake.

GEO. S. BARNES, Fargo.

WILLIAM McHENRY, St. Charles.

O. M. LORD, Minnesota City.

CLARENCE WEDGE, Albert Lea.

E. MEYER, St. Peter.

M. CUTLER, Sumter.

G. W. FULLER, Litchfield.

L. E. DAY, Farmington.

CHAS. LUDLUFF, Carver.

W. E. BRIMHALL, St. Paul.

Discussion on same.

Fruit for Farmer's Families. O. M. Lord, Minnesota City.

Small Fruit for Profit. Geo. J. Kellogg, Janesville, Wis.

Discussion on same.

Report of Committee on award of Premiums.

AFTERNOON SESSION.—AT 2 P. M.

Ornamentation of Homes. J. M. Underwood, Lake City.

Landscape Gardening and Public Parks. H. W. S. Cleveland, Chicago, Ill.

Evergreens and Their Uses. A. W. Sias, Rochester.

Coniferous Trees of the Rocky Mountains, their value and adaptation to the treeless prairies of the Northwest. D. S. Grimes, Denver, Col.

Our Treeless Prairies. S. M. Emery, Lake City.

Notes on Forestry. M. Cutler, Sumter.

Miscellaneous Business.

Revision of Fruit List.

Place for Next Meeting.

Report Committee on Final Resolutions.

Question Box; the Bird Question, etc.

Announcement of Standing Committees.

Final Adjournment.

PREMIUM LIST.

WYMAM ELLIOT, SUPERINTENDENT OF EXHIBITS.

APPLES.

Best display of Wealthy Apples, first premium, \$5.00; second, \$3.00; third \$2.00.

For plates of Winter Apples in good condition, any variety, first premium, \$2.00; second premium, \$1.00. Five specimens to constitute a plate.

GRAPES.

Best plate of grapes in good keeping order, first premium, \$5.00; second, \$3.00; third, \$2.00.

PLANTS AND FLOWERS.

	1st Prem.	2nd Prem
Best display ornamental and flowering plants.....	\$5 00	\$3 00
Best floral design.....	7 00	5 00
Best pyramidal design bouquet.....	5 00	3 00
Best display of roses in pots.....	2 0	1 00
Best display of geraniums	2 00	1 00
Best hand bouquet.....	2 00	1 00
Best single plant in bloom.....	2 00	1 00
Best display begonias.....	2 00	1 00
Best display carnations	2 00	1 00

VEGETABLES.

	1st Prem.	2d Prem.
Best display.....	\$5 00	\$3 00
Best half peck early potatoes....	2 00	1 00
Best half peck potatoes for winter and spring.....	2 00	1 00
Best half peck onions.....	2 00	1 00
Best half peck turnips.....	2 00	1 00
Best half peck beets.....	1 00	50
Best half peck parsnips.....	1 00	50
Best half peck carrots.....	1 00	50
Best Hubbard squash.....	1 00	50
Best bunch celery	1 00	50
Best winter cabbage.....	1 00	50

SEEDS.

Best display Minnesota grown garden seeds, first premium \$5.00; second, \$3.00.

PANTRY STORES.

Best display canned fruits, \$3.00; second best, \$2.00.

Best display jellies, \$2.00; second best, \$1.00.

Best jar mixed pickles, \$1.00; second best, 50 cents.

Best sample home-made vinegar, \$1.00; second best, 50 cents.

Best sample comb-honey, \$1.00; second best, 50 cents.

Best sample strained honey, \$1.00; second best, 50 cents.

WORKS OF ART.

Collection of paintings, fruits and flowers, first premium, \$5.00; second, \$3.00.

Best single fruit painting, \$3.00; second, \$2 00.

Exhibitors are expected to make their entries the first day. All exhibits must be in place by 10 o'clock A. M. the second day.

Competition shall be open to all, but it is expected that the annual membership fee will be contributed unless exhibitors are members of the Society.



ANNUAL WINTER MEETING
OF THE
MINNESOTA
STATE HORTICULTURAL SOCIETY,

HELD AT HARRISON'S HALL, MINNEAPOLIS,

JANUARY 19, 20, 21 and 22, 1886.

The nineteenth annual winter meeting of the State Horticultural Society, held at Harrison's Hall, Minneapolis, was opened Tuesday, January 19, 1886. The meeting was called to order at 10:30 o'clock A. M., by the President, Truman M. Smith, of St. Paul.

Prayer was offered by G. W. Fuller, of Litchfield.

Secretary Hillman being called to Winona, as a witness in an important railroad case, his brother, Wm. O. Hillman, of St. Paul, served in his place during the first three days of the session.

Mr. Cyrus L. Smith, of Minneapolis, served as Assistant Secretary during the entire session.

President Smith. The first order of exercises is the arrangement of exhibits and the reception of members.

Col. Stevens. A committee for the reception of members has been selected for the purpose of providing entertainment of members and delegates. Perhaps it would be well to have it understood at the outset who the members of the committee are, so that visitors can go to them, and find where they will stay while in the city.

Mr. Pearce. We have a place for all that come, and at the proper time they may come to Mr. Elliot, Mr. Roberts, Mr. Grimes, Mr. Lyons and myself. As soon as we adjourn this forenoon, if visitors will come to the committee, we will designate a place for each of them.

President Smith. There is a committee to appoint on awarding premiums, on finance and others; I would announce as a Committee on Awarding Premiums, Messrs. M. J. Hoag, of Rochester, W. E. Brimhall, of St. Paul, and F. G. Gould, of Excelsior.

The Committee on Finances is already appointed, as by the constitution of the Society, the Executive Committee, with the exception of the President, Secretary and Treasurer, compose the finance committee.

As a committee on Final Resolutions, I will appoint Messrs. J. S. Harris, of La Crescent, Col. J. H. Stevens, of Minneapolis, and G. W. Fuller, of Litchfield.

The committee on Obituaries should now be appointed; has anyone any suggestions to make with reference to that committee?

Mr. Harris. I would suggest that Col. Stevens, and the Secretary, Mr. Hillman, and Mr. Sias be on that committee.

The Chair accordingly appointed Col. J. H. Stevens, A. W. Sias and S. D. Hillman as a Committee on Obituary.

Mr. Harris. Mr. President, I think it would facilitate business somewhat, to appoint committees on the different branches of fruit, to recommend varieties for cultivation and for trial; for instance, a committee on grapes, and a committee of three on Russian apples. Of course, these matters will be discussed by the Society, but we will hardly have time to revise our whole list in these discussions; and, for that reason, I propose the appointment of committees. There are questions that should come before committees, and not before the Society; for instance, taking the Russian varieties, they are but little known by the mass of the people, and there are members here who are familiar with them. I would move that a committee of three be appointed to select a list of Russian apples, of eight or less varieties for general cultivation, and also eight varieties, or less for trial, and let the report of that committee be the action of the Society.

President Smith. I should be opposed to recommending eight varieties of those apples. I think, as we have our Experimental Stations and University Farm, we had better let them have a longer trial, and be thoroughly tested before committing ourselves by recommending

particular varieties, so that the purchasers may not blame this Society. Where this Society has put forward varieties one year, which it has condemned the year following it has injured us. Eight varieties are more, perhaps, than we could conscientiously recommend.

The motion of Mr. Harris was adopted.

Mr. Pearce. I would move that this committee be appointed by the Society, and that as chairman of that committee, Mr. Tuttle, of Baraboo, Wis., be appointed.

Mr. Tuttle. I should object to serving on that committee. I am propagating Russian apples to some extent; I can tell what I know about them and I prefer to do it, rather than act as a member of the committee.

President Smith. What is the pleasure of the Society as to excusing Mr. Tuttle?

Mr. Smith. The object of that committee is to make a report as coming from this Society, and I agree with Mr. Tuttle entirely; he is a propagator of Russian apples, and is offering them for sale, and although I have no doubt of his honesty, I think that committee should be composed of men not engaged in the selling and propagation of those trees, if you want to get a report that will have any force whatever. Here is Mr. Grimes, Mr. Cutler, Mr. Whipple, Mr. Hoag of Rochester, and others that are not engaged in selling trees; they can consult with these men that are propagating them, and recommend on the strength of that. Here is Mr. Peterson who is not engaged in selling those trees, and who has had a good deal of experience with them.

Mr. Tuttle. I would be willing to state to the committee the experience I have had with Russian fruits. I think that it would be far better that a report should come from disinterested persons not prominently known as propagators of those Russian apples.

Mr. Pearce. I think that every member of this Society has entire confidence in the integrity of Mr. Tuttle; I am very certain that he is better posted on Russian fruits than anybody else. I withdraw my motion and nominate, as chairman of that committee, Mr. A. W. Sias, of Rochester.

Mr. Sias. I object to serving on the same ground that Mr. Tuttle has given. I am a propagator, on a small scale, of Russian apples, and that I think, is reason enough for declining to serve on that committee.

Mr. Harris. Mr. President, I have entire confidence in the honesty

of Mr. Tuttle and of Mr. Sias, but I would like to see men placed on these committees who are known to be disinterested, so that it will not look as if our Society was run in the interests of the nurserymen. For that reason I would object to Mr. Sias; but I would be very much in favor of Mr. Hoag. He lives close by Mr. Sias, has seen his trees and knows how they behave. Mr. Peterson would be a good man, or almost any other man that knows how the Russians behave. We want a competent committee, for in making a report, the committee will have to state that they recommend such and such varieties.

Mr. Sias. Mr. President, my neighbor, Mr. Hoag, although not a nurseryman, was brought up in a nursery, and is one of the best posted men in the State in horticulture.

Mr. Pearce. My object in nominating those men was to get a report from the men who were most likely to be the best informed. I like my information fresh from its source. I contend now if you do not put them on the committee, you have got to go to these men and take the results of their experience and your committee will have to get their report from them after all. But if objection is made to it, I will withdraw my motion and nominate Mr. Hoag.

The motion was adopted.

The Chair then announced that he would appoint M. J. Hoag, M. Cutler and A. Peterson, as a committee on Russian apples.

Mr. Pearce. Mr. President, I move that a committee on grapes be appointed who shall recommend a certain number of varieties for cultivation, and a certain number of varieties for trial.

The motion was adopted.

President Smith. In appointing this committee I will say that I feel the responsibility of it, and will appoint men that I think have had some experience. I will appoint J. S. Harris, J. T. Grimes and W. E. Brimhall.

Col. Stevens. Mr. President, I would like to see the western part of Minnesota represented, and I move that Mr. Regester, of Granite Falls, be added to the committee.

Mr. Regester. Mr. President, I would object to serving; I am expecting the president of our home Society here to-day. His name is O. E. Saunders. I would decline in his favor.

Col. Stevens accepted the amendment, and the motion making Mr. Saunders a fourth member of the committee on grapes was adopted.

Col. Stevens. As this makes an even number on that committee, I would suggest that another member be added, a man that knows all

about grape culture, and that is our president. I think that he ought to be added to that committee. There is no question but what he has had as much experience as any or all of us put together. I move that our president be added to that committee.

The motion was adopted.

On motion, the meeting then adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

TUESDAY, JANUARY 19, 1886.

The meeting was called to order by the President at 2 o'clock P. M.

ADDRESS OF WELCOME.

Prof. Edward D. Porter, of the State University Farm was introduced and delivered the following Address of Welcome:

Mr. President, and Gentlemen of the Horticultural Society:

I feel myself, sir, very highly honored in being called upon to extend to you the congratulations of the horticulturists of Hennepin County and the citizens of Minneapolis upon this your nineteenth annual meeting. We greet you, sir, not as strangers in our midst, for your annual gatherings for years past have been looked forward to by our citizens with pleasure and with profit. We greet you also, gentlemen, not only for the many pleasant social relations which have been formed by these gatherings, but for the honor of the work in which you are engaged. By your efforts you have removed the stigma which rested in the early years of our State history upon us, because our soil, they said, was unfruitful and our climate uncongenial, incapable of producing anything but snow and ice, and pine trees and prairies. But your efforts have shown, that, in addition to these, and fair women and noble men, and an abundance of No. 1 hard wheat, we can compete with the world in the production of flowers and fruits and vegetables, these three graces of agriculture which add beauty and comfort to the strength of the other products of the soil. But, gentlemen, these results have not been accomplished without untiring labor and ceaseless energy. The difficulties, discouragements and failures in horticulture in this State in the past thirty years have been enough to dishearten men of average courage, but, as "a smooth sea never made a skillful

mariner," these failures have only stimulated you to greater effort and these difficulties met and mastered, have not only accomplished grand results in our State, but have placed you, gentlemen, in the front rank among the horticulturists of this or any other land. We honor them for the work that they have accomplished, and hoping, that your stay in our midst may be as pleasant to you as we know it will be agreeable to us, and believing that your labors and deliberations will be of lasting benefit to our State, we bid you, sir, a most cordial welcome.

RESPONSE TO THE ADDRESS OF WELCOME.

Mr. Geo. W. Fuller, of Litchfield, responded on behalf of the Society. He said:

Mr. President:

We have too often enjoyed the hospitalities of this city not to know that these are not the words of a mere formal address, but are the expressions of the real feelings of the citizens of Minneapolis.

You are building here a great city. And you are wise in planning to make it great, not only in the census of its inhabitants; in the number and magnitude of its buildings and in its manufacturing and business establishments; but great also in the æsthetic, mental, moral and religious power of its citizens.

Hence, your schools, your churches, your societies for encouraging music and the fine arts, your beautiful homes, surrounded by lawns and flowers; your shade trees and grand system of public parks.

God has put into every soul an element of love for the beautiful. And all these things have an educating as well as restraining power.

Keep a flowering plant in every house, a pure painting on every wall, a grass plot and shrubs about every home, and your streets shady and clean, and the people, even the lowest, will measurably approximate in character to their surroundings.

And He has given us flowers and plants and fruits innumerable to meet and satisfy the demands of our nature. And He has made even the fruits and vegetables to contribute to the beautiful before they do to our grosser needs, the blossoms and the changing tints coming before the perfected fruit.

And it is our work to do what we may, to extend the cultivation and influence of these God-given fruits and flowers.

We are confident that an increased interest in these things is ex-

tending through our State, not only in the cities and villages but in the country as well, and that soon beautiful as well as comfortable homes will be the rule in country and town. And we are glad that in this city so strong an interest is manifest in this direction.

I believe, Prof. Porter, you are building what is to be one of the most beautiful cities on earth.

We thank you for inviting us now to enjoy its hospitalities.

Col. J. H. Stevens, of Minneapolis, next read a paper entitled "Practical Suggestions for Horticulturists," which was received with applause, and on motion, a copy was requested for publication in the annual report. Following is the paper referred to :

PRACTICAL SUGGESTIONS FOR HORTICULTURISTS.

By J. H. STEVENS, MINNEAPOLIS.

Mr. President, Ladies and Gentlemen of the Minnesota Horticultural Society:

In responding to the demand made upon me to prepare a paper on the subject of Practical Horticulture in Minnesota, permit me to say that my time has been so constantly occupied with editorial and other labor, that I have not been able to prepare an address which the importance of the subject demands. I am not prepared to admit that we will not in the early future have enough fruit for our own use, and a surplus to export.

While it is true we cannot make as favorable a showing as we wish we could, we must not blame our climate and soil for all of our failures, because frequently our trees die of neglect or are eaten up by insects. We should not be surprised at this, for we are assured that in some of the best apple growing communities on this continent, that at least one-half of the newly transplanted trees are starved to death, one-fourth more are destroyed by borers, cattle, bad trimming and other enemies. So that the full proportion of those set, which never bear an apple is fully three fourths.

While our citizens are intensely practical as a class, we are sadly deficient in correct experiments, equality of circumstances which might influence the result and perfect accuracy in every particular are absolutely necessary in order to derive benefit from these experiments, and even after having done all in the most accurate manner, it would not seem to be safe to form positive conclusions from the results of one, two or three trials, for there may be circumstances unknown to us, or beyond our control, which might give a result from which we should, if we depended on it, form wrong conclusions; or spreading abroad, we might probably mislead others. It is safe to believe that many an inquirer after horticultural truth may be discouraged by the apparent conflicting of the results of experiments, and it may be, is led to think that it makes no great difference after all, which way a given thing is done. Any way our experiments already made in Minnesota, in growing fruits has developed three facts, viz:

First. That there are a few—a very few varieties—standard apples that are iron

clad up to this time, the origin of which is generally believed to be of a Siberian parentage; that we have great expectations from seedlings such as Peter M. Gideon, and others have propagated, and are in great hopes that the Russian varieties so extensively introduced may prove hardy. The iron clads already mentioned, with the numerous Russians, together with the hybrids—say the Whitney, the Beeches Sweet, and near fifty other semi-crab sorts, will, it is believed by our most practical fruit growers in an early year—furnish us an abundant supply of apples. The native wild, and the descendents from them, gives us a good supply of plums, just about as good as any of the tame varieties that are raised in the east.

Second. There is not a state in the Union that excels us in the production of small fruits; currants, gooseberries, strawberries and raspberries are all at home in our soil. It is to be greatly regretted that the blackberry could not be added to the list, in order that it should be complete, but it is almost proven to a certainty by many of our best fruit growers, that such varieties as the Ancient Briton, Stone's Hardy and the Snyder, may yet with proper care be grown with success.

Third. Grapes of many varieties are certain, and an exceedingly profitable crop. We bid fair to rival the vine clad regions of the old country in their product. They are within the reach of all, no farmer or gardener nor householder can afford the absence of the luxury from their premises.

With these considerations it is difficult to arrive at any other conclusion than the practicability of growing fruit in this State. If it could be proved, that no man had ever made money for his labor through fruit growing in Minnesota, as an occupation, and that all following it had been always obliged to restrict themselves to the greatest economy, in order to gain a livelihood, that it never in any instance paid a fair profit on the capital invested, then indeed, we might be somewhat disheartened, and might consider our case rather a hopeless one. But a very different state of things can be proven. It is well known that our fruit growers in the vicinity of St Paul and Minneapolis, have made money, especially this is so with our small fruit and grape growers. I speak of those, because I am acquainted with them, if those engaged in this industry in the neighborhoods mentioned here made it pay—others throughout the State can, in like manner make it pay. It is a true saying that "whatever man has done, man may do."

I do not deny but what to produce fruit of the larger varieties requires patience and practice and work in this climate. The powers of earth, air, frost and water have joined those of the far distant sun, and during the hitherto rather short life of most of our apple trees, there has been an example of a complication of the most wonderful laws of nature. It seems to have been ordained that every step in the knowledge of apple growing must be won by trial and exertion, and thus it has been during the past year; we are only able to slowly unfold the wonders that occurred by the severe test of the winter of 1885; wonders we might add that are occurring on every side during the every day experience of horticultural life. The field, too, widens as we advance, until we find that every step has its consequence; every breath of air its appointed mission; every drop of dew its office to perform; we discover that we are in the midst of causes and results, of which our knowledge is limited; that the threads we have seized only guide us to new and more difficult labyrinths of investigation. What we know dwindles away, when we compare it with the sum of that which we desire to know. We realize we have

to contend with climatic influences, but "let us work on and win." We are morally certain of being victorious in the end. None need be discouraged so long as we are favored with so many encouraging results which have been handed down from the recent past. These show not only what fruit growing may be, but what it is. It will doubtless be said that this is rather a slow way of reporting progress. Be it so, it is a sure way. The injury to apple trees by the strange fatality of last winter's phenomenon, was not confined to Minnesota. It reached south to Missouri and east beyond the big lakes. When we consider the injury inflicted on the trees in these celebrated apple producing states, remote from our boundaries, we have abundant reason to be thankful that we had even five or six varieties of the standard apple, that survived the frosty element, even to the terminal bud of the branches of the trees. This is encouraging. It shows that we have the *pyrus malus* that are iron clad. They should be in the hands of all of our farmers. If we have one, two, three, four, five and six varieties, now, we may reasonably expect the introduction of more of the same sort every year. This is a law of nature. Let no one forget it. Our worthy old pomologist, Peter M. Gideon, has some forty varieties of new seedlings which he has propagated on the shores of Lake Minnetonka, which are quite equal to the Wealthy. Some are hardier than that famous apple. Some too, are of more merit, and are longer keepers. All of these will soon be scattered all over the four corners of the State. Several other gentlemen in this State have, too, new seedlings that defied last winter's frosts. No one denies but we have many things to learn yet in regard to pomology. Probably if it were made a rule in moving trees to reduce the last year's growth to one bud, half the failure in transplanting would not occur, provided the proper care had been bestowed on the new set out trees, because the head and roots would be brought at once to something like a balance of power. Shortening-in and mulching trees ought to be followed as established practical rules in this climate in transplanting, every deciduous tree requiring more care than a willow. We all know that the best growth and the finest fruit, are always to be expected when the tree is furnished with the materials of nutriment in just the right proportion. If greatly deficient in any essential ingredient, the tree languishes from starvation. If any highly nutritive substance is in a large overdose the tree may be surfeited or poisoned.

We must bear in mind that in large portions of Minnesota the soil is very fertile and rich. During the months of June, July, August and September, we have the average temperature of southern Ohio. The overfeeding of one year's growth is worse than lost. Several years will be required to establish a healthy action again, especially if the tree stands in a rich soil so as to dissolve a great amount of food. There is certainly a great contrast in the temperature in our State between summer and winter; certain laws of pomology must be observed. These laws have heretofore and will be hereafter pretty thoroughly analyzed by the Minnesota State Horticultural Society. They will be made so plain that all can understand and master them.

It is well demonstrated that the few varieties of apples we do produce are far superior in quality to those same varieties in other States. This is another curious law of nature, with the law on our side. It is an ill wind that does not blow some one good. Again, apples, the product of Minnesota, are finished off in the most

artistic manner. Dame Nature's master hand paints and polishes them in the most satisfactory and beautiful manner, our most celebrated artists cannot do them justice with their talented pencils. Usually the plates of the tree peddlers are far ahead of the appearance of the original fruit, but the autumnal tint bestowed on the bright, glossy, delicate hue of the Minnesota fruit defies the handiwork of the most far-famed painter's brush, hence, when on exhibition competing for premiums, we always come out ahead. Witness our success over all competitors at the American Pomological Society in the autumn of 1883, at Philadelphia, and again at the world's exposition in New Orleans, last winter.

Many failures occur in Minnesota for a want of seasonable attention. These failures should not be charged to the impracticability of growing fruit, neither should our northwest nurserymen be blamed for so many failures. If properly sifted a good deal of the trouble comes pretty near our own doors. Now, when all the causes are properly analyzed it may be, we are not justified in attributing to the climate and soil so large a share of our disasters. It is better to divide the responsibility so that the frosts of winter and the heat of summer, the manner in which we cultivate our trees, our soil and climate, can all come in with a co-equal assumption of our misfortune. There is no doubt of one great cause of the failure of fruit in Minnesota. It is patent to everyone except the victims. It is the accursed foreign tree peddler, they will humbug most every farmer to give copious orders for trees that are perfectly worthless, at the same time many of these victims would utterly refuse to consider an order from our own nurserymen where they could get honest stock true to name. It stands our nurserymen in hand to be honest, if otherwise they would kill the goose that lays the golden egg. It is by no means any proof that this is not a fruit producing State, because of the failures from the trees purchased of these dishonest outsiders.

The site of orchards have a good deal to do with the practicability of growing fruit in Minnesota. Selections can be made on a quarter section of land, that would be called favorable locations. At the same time the site of an orchard could be selected on the same quarter section that would prove to be unfavorable.

Finally, Mr. President, if we come down to pretty near the facts in the case, we shall find that in proportion to the numbers engaged, that there will not be a great difference in the failure of those engaged in horticultural pursuits, and those that are engaged in a strictly legitimate agricultural industry. The books will be pretty nearly balanced.

DISCUSSION.

Prof. Porter. I wish to bear my testimony to one statement that Col. Stevens has made, that the cause of failure in fruit growing in Minnesota, as well as in other portions of the old states, is largely due to the neglect and carelessness of the grower, and not to the climate nor to the stock that is grown. I will venture to say that throughout Minnesota, the proportion will be larger than Col. Stevens has mentioned of trees that have received no attention whatever. They have been received from the nursery, set out in unprepared

soil, "wished" well, and that is the end of it. All the varied conditions of climate and the required treatment are forgotten. These methods fail to give the very best results, and fruit-growing is condemned. It is very rarely the case that in traveling over our State and examining apple orchards or small fruit, that I have found an orchard or garden that is half tended, that is not overgrown to weeds and grass, the common pasture field for all kinds of stock, no protection, either in winter or summer, and no pruning. One thing that has struck me very forcibly, especially in this whole Northwest, is this neglect of pruning trees. There seems to be a sentiment among our farmers that you must not touch a tree after it is once put in the ground. I think we should share a portion of the responsibility with Dame Nature.

Mr. Pearce. Another thing occurs to me. I think a great drawback to our fruit-growers is that they labor under a wrong idea as to the best locality to plant their trees.

Since 1854 farmers, universally, have been looking for an old piece of land, well protected by timber as an orchard site, the warmest place they had on their farms. To-day, if you travel over the country, you will find orchards on just such localities. The reverse of that I believe to be the correct plan of growing orchards. If you have a piece of land, high, smooth, unprotected, there is where you should put your trees. Where the Wealthy, is on the highest pinacles of Minnesota, it is in the best condition.

Mr. Smith. Mr. President, I set out an orchard fifteen years ago, and tried to get the trees in the most sheltered situation we could find. Those trees that were in the most exposed localities were the ones that stood the winter's blast, and the trying ordeal of last winter.

I made a few notes in regard to what the Colonel said. He says "Fruit growers have been making money." I want to speak of one case that was reported to our local society of a man near here that set out an acre of strawberries. It was the first experience that the man had ever had. He planted just about an acre of strawberries, first in the season of 1884. In 1885 he sold from that one acre \$400 worth of berries, at a net profit of \$300. Again the Colonel said he thought one man could do what another had done under the like circumstances. Now, there is Mr. Nobles; he has been successful in grape growing in McLeod County. I was at his place just as his Concords were ripening, and his vines were loaded with great, beautiful clusters of fruit. It is

worth remembering that he is a successful fruit grower out in McLeod County.

As to raspberries and blackberries, I am thoroughly convinced that covering with good clean soil is the only certain protection for them, and I know that that can be successfully and profitably done; that we can afford to cover the same as grape vines, and make a certainty of every crop. I am glad to say that that has been practised. Another thing: In setting out apple trees there should be very deep stirring of the soil before the trees are set. If it is where you can plow, run three or four furrows, and back-furrow on that, until you get two or three feet of loose soil; then set the tree. If you set the tree without plowing, dig a hole three or four feet across, stirring the ground thoroughly, then mulch. We have to fight drought in this country, and it is in this way that our trees can be made to stand our winter's cold and the summer's drought. I would ask Mr. Chandler to state how he covers his blackberries?

Mr. Chandler. I turn them over, and cover them with fine, loose dirt, not more than three or four inches in depth.

Prof. Porter. I will give the method I have been practicing for the last thirty years for covering blackberries, which I find very effectual, and it is applicable to grapes, raspberries and blackberries. In the first place, I want the ground clean. I get that by careful tillage in the proper season of the year; but I don't want any cultivation in my orchard, except the merest surface cultivation. I want it done early in the season, and then check the late growth by pinching back. I have just enough surface cultivation after that to stimulate the late fall's growth, and the first frost kills the leaf. Then I endeavor to bind my vines all in one direction. The direction, of course your rows will determine. I make a small mound of earth against the vine, making a shoulder, as it were, over which the vines are bent, so as to prevent the breaking of the canes, and then I cover with the soil. It is not a very great depth of covering that is desired; two or three inches is as good as two or three feet. It is simply to protect the canes, not from the frost altogether, but from the sun and wind. I have been engaged in fruit growing about thirty-five years, and have found that it paid in Pennsylvania and Delaware to cover my vines, as it pays in Minnesota. While it was not necessary to cover, with many varieties, to prevent winter-killing, the increased productiveness, the certainty of a finer crop more than compensated for the labor performed. Of course, there are some varieties that cannot be grown,

even in the mildest climates, without this protection; but all varieties of grape vines, amply repay for this protection.

Mr. Harris. I would like to inquire if raspberries are treated in the same way as blackberries?

Prof. Porter. In the same way; I loosen the soil around the root so that it will bend without breaking. I will say that in preparing the plant for going into winter quarters by checking the growth, I do that by simply pinching; I don't want any knife, but by the thumb and finger pinch back the vine, throwing all the strength into the cane. In growing blackberries, I allow my canes to grow until about three feet in height. If let alone, a blackberry bush will make a rank growth, and has been known to grow seventeen feet of cane in one season. Of course, in that case you would have to cut about twelve feet off. By this process of pinching back you throw the strength of the vines into the fruiting buds, with this protection you can grow them without difficulty.

A Member. How do you cultivate your raspberries in the summer?

Prof. Porter. Well, sir, in the first place I want them planted in rows, for the purpose of economy of cultivation. I prefer growing in rows so that they can be cultivated, leaving plenty of room between the rows for thorough cultivation. I commence by plowing from the rows. I approach the hills until the plow strikes the rootlets of the plants, and am not afraid of injuring them. I find it stimulates the growth of the fruit more than enough to compensate for any damage done. After throwing the furrows from the vine, leaving a center unbroken, I then put the cultivators in and keep the ground thoroughly tilled and cultivated for a week or ten days, working it back towards the vines. After that there is nothing but the merest surface cultivation. I was led to this method of cultivation about twenty-four years ago. It was just after the commencement of the war, in 1862. I was in the grounds of a large grower of small fruits in southern New Jersey. He had a lot of raspberries and blackberries. He was a Northern man and a Quaker, and had an immense stock there, which he couldn't sell, and of course it was a great loss. He had a great success in the cultivation of the blackberry. In July, when I went through with him, in many places the fire weeds, jimson weeds, and grass was all over his patch of seventy-five acres, and you would have to hunt to find his blackberries. I laughed at him and asked him if he called that a model garden. The old gentleman stands about six feet, six, is well proportioned, very moderate and very slow in his speech, but direct

and simple. "Well now," he says, "friend Porter, I know that at first glance, it looks as if it was very slovenly; but after thee has been as long at gardening as I have, thee will not allow a hoe or cultivator among thy vines after the blossoms have set." And then he went on to explain. "Now," said he, "I used to till late in the summer, but I found in the first place, that I was stimulating an undue growth in my vines, and in the second place, I was running the chance of losing the crop by winter-freezing and thawing. I stopped that, and I have had no trouble with winter-killing." I took the hint and have adopted his methods, with some modifications. I don't want to conceal my vines; I like to see them. I like to cut the weeds out, and I can accomplish that with the merest surface culture, just cutting the weeds, and at the same time not stirring the soil enough to stimulate the late fall's growth.

Mr. Harris. When I came here this afternoon I had no idea of having anything to say to-day, but I am very much pleased with this discussion in reference to blackberries. I think it is important to prevent the breaking of the canes in laying them down, to dig away from the roots with a fork, from the side you bend them, and then bend the bush where it joins to the root, putting the fork down about six inches and bending the root. Then there is no danger of breaking.

Prof. Porter. That is necessary with very strong, heavy canes. Of course, you have to use a little common sense.

Mr. Harris. It has been said here that the most exposed situations are the best for orchards. Mr. President, I hope that no one will understand this Horticultural Society as advocating the seeking of the most barren peaks and exposed situations of Minnesota, for the planting of apple trees. I believe in high locations for apple trees, but not the most exposed. The best locations are high, but protected from the south and west winds. I believe we can raise apples on the prairies here, but we will not succeed until there are groves and wind-breaks all over between here and Dakota.

And then, I want to criticise those holes "three feet deep" for setting out apple trees. I don't dig any deeper than the ground has been pulverized with the plow. I like the idea of plowing; and if you dig a hole three or four feet square and half as deep, put in the loose dirt and set your trees, I will guarantee they will grow.

Mr. Pearce. In regard to covering small fruit, there is nothing that can be covered more easily than blackberries. If I was going to grow berries for profit, in preference to any I would take the blackberries.

The Philadelphia and the Turner raspberry don't need any covering to keep them. I don't think there is a place in Minnesota but what they will do well. The Cuthbert raspberry is one of the most valuable we have; it brings the highest price in the market, has a firm berry and you can ship it a thousand miles. But probably every third winter they would kill. They are of so much real value that it is worth a man's attention to cover them. My method of covering is very simple. It takes three men to cover to advantage. My canes are in rows, about twenty inches apart. I first provide myself with a pair of buckskin gloves to take hold of the canes. One man goes ahead with a fork and loosens the ground about the roots. Then I take hold of the cane and pull it down from the roots; I don't bend the stalk, I bend the root. One man puts about two shovels of dirt where the ends of the canes come together. I can cover an acre or more in a day. In my experience I find there is no occasion of covering the plants entirely; all you want is to keep them flat on the ground. I have tried it repeatedly. With blackberries I use a fork to loosen the earth around the roots. I take hold of the cane and bend it from the root; bend it right over, and when I get it laid flat a man stands by and puts a shovel of dirt on, which holds it. Three men will cover an acre of blackberries in that way in a day. I think the fork is the best thing that can be used. My experience is that if I get the plants to the ground and keep them flat there, they need no more covering. I covered all my Cuthberts this year in that way, and my blackberries.

A Member. Do you cover in hills or rows?

Mr. Pearce. The hills are in rows about three feet apart.

A Member. How many canes in a hill?

Mr. Pearce. Two or three. Then in the spring I take a fork, throw the dirt off, and raise them up.

A Member. I wish to ask if they have fruited well when not covered?

Mr. Pearce. I had some last year which I did not cover; they came out alive but with no fruitage.

Col. Stevens. We have a gentleman here who has been engaged in cultivating blackberries for thirty years. The variety that he has raised has been confined exclusively, or nearly so, to the Lawton. I have reference to Mr. John A. Ford, of Newport. I have known him for forty years. He came to Minnesota in 1841. He is present to-day. I would like to have him state to the meeting the manner that he cultivates the Lawton berry. I understand that he has never made

a failure during the whole time that he has had them, for twenty odd years.

Mr. Ford. I first commenced setting out the wild ones. I began the practice of covering them up, and I found they fruited much better. In the first place I got a thousand plants of a common variety which I tried for several years; they grew up immense canes, and when covered they would come out all right, but I found that they did not pay very well. I got a few Lawton's by accident, which a man had thrown away. I have been cultivating them, about twenty years. They have to be covered, but are very prolific, more so than anything I have ever seen. I have about an acre and a half. I also have the Snyder. They are a very good berry, they need cultivating; are not so large as the Lawton; they grow most too strong. The Lawton grows up four or five feet high, is more slender, and is easily laid down; I like it for that reason, and because it is the greatest bearer I have ever seen anywhere.

Col. Stevens. As long as I have lived in Minnesota, I never knew before that the Lawton blackberry could be ripened and grown to perfection in this State. Although I have seen Mr. Ford frequently, I never knew until to-day that he had met with such extraordinary success in their cultivation. I certainly feel as if we were gaining a great deal by his experience, and I would like to have him state how and with what he covers them, and what do you use for mulching?

Mr. Ford. I used to use straw; for the last two years I have used sorghum bagasse. In laying down I have a pair of buckskin mittens, and I take hold of the stalk, bend them down and throw dirt over them. I find the Lawton is the easiest to lay down. I just cover them lightly. If they are covered half an inch deep they are all right. If there is one sticks out an inch, it is killed to the ground.

Mr. Tuttle. Blackberries are very extensively grown in the neighborhood of Ripon, Wis. There are about sixty acres in cultivation there. Mr. Hamilton is the principal grower, and has been growing them, he tells me, for twelve years, and has never had a failure. His manner of covering is the same as that spoken of by Mr. Pearce. With a fork he digs the dirt from one side of the plant, puts his foot at the base, and pushes the roots over. The root will bend very easily, especially if laid down the first year; if you don't bend it over the first year you will have a good deal more work to bend and cover the second or third year. A portion of mine have never been laid down until this year. Mr. Hamilton tells me that two men will put down

an acre in a day. Blackberries are grown without much difficulty in Wisconsin; I never thought it was really necessary to cover them. I have been growing them some years, and one or two winters I have lost the crop by the vines winter-killing. I lost a crop last winter. The winter before they came through all right, without any protection whatever. There is no more work attending the covering of an acre of blackberries than there is an acre of strawberries, and a crop of blackberries is much more profitable.

A Member. How much fruit do you get on an acre?

Mr. Tuttle. I have grown ten thousand quarts on an acre. I have one acre of blackberries that I am very careful of. I am going to report what they produce in the future, and I believe that I shall report ten thousand quarts.

A Member. What is the kind?

Mr. Tuttle. The Ancient Briton. It is a larger berry than Stone's Hardy, more nearly the size of the Lawton, and is a great deal better in quality. Last year Mr. Hamilton's were a failure. He told me he had Stone's Hardy principally which he got on account of its extreme hardiness. In my experience it is not as hardy as the Ancient Briton, and he told me this fall at my place that he never would send out under his name any more fruit of the Stone's Hardy; that he had a reputation for what was called the "Ripon berries," and he didn't care to send out anything but the Ancient Briton; he said he had ordered the men to dig up all the Stone's Hardy and put them on the brush-pile.

Col. Stevens. I would like to ask Mr. Tuttle what he gets a quart.

Mr. Tuttle. The lowest Mr. Hamilton ever gets is ten cents; sometimes he gets eighteen cents a quart.

Col. Stevens. If you get ten cents a quart, and grow 10,000 quarts to an acre, that amounts to \$1,000 per acre.

Mr. Tuttle. That is what I am trying to do; I believe it can be done.

Mr. Barrett. You gentlemen talk as though blackberries were a success. They are a perfect failure with us, in every attempt that we have made in our locality. I procured some vines from Wisconsin, of the Ancient Briton, took proper care to cover them in the fall; the next spring they were very feeble, and during the succeeding summer they died. If any gentleman of experience can tell us how we can raise blackberries, he will tell us something of importance.

Mr. Fuller. I have never succeeded in growing blackberries on the

prairies beyond the big woods, but perhaps one reason is we have never tried the variety spoken of here. I intended to get a few vines of the Ancient Briton last year, but have not done so; I propose to try it another year. The Turner raspberry is the only kind that I grow; that does very well, and I get good crops.

Mr. Smith. I would like to ask Mr. Fuller if black raspberries don't grow there?

Mr. Fuller. No, sir, I think not without protection. The vines will winter-kill. We get a very good crop of black raspberries by cutting them off to the ground in the spring, and get very nice berries from the new growth. We have not practiced covering.

Mr. Cutler. I have had a little experience in trying to raise blackberries. Two years ago from the Ancient Briton I picked a little over 200 quarts, but since then have had but few berries. I have the Snyders; they are very prolific, and the Stone's Hardy; last winter they killed to the snow line. There were a few left below the snow line that blossomed, but produced no berries. I have come to the conclusion that the only way we can grow raspberries successfully, except the Turner, is by covering. Last fall I covered my Stone's Hardy, according to Mr. Pearce's method. I think we can raise blackberries, provided we cover and preserve them during the winter in that way.

Mr. Saunders. I would like to inquire if anyone has had trouble with the blight? In our vicinity, Chippewa and Yellow Medicine Counties, we are troubled considerably with that. The fruit blossoms well and sets, but when it has attained the size of a small pea, it blights, so that I have lost my crop for one or two years. I have the Doolittle, and some other varieties that I have cultivated with success, have this year done poorly.

Mr. Pearce. One word further on the raspberry in regard to this matter of winter-killing. The Gregg raspberry will kill, I believe, every winter in Minnesota; at the same time, it is the largest and best we have. I am growing them; a year ago I was very successful. I bank them up in the fall, from a foot to fifteen inches, in the spring I cut them back to sound wood, I then take the dirt and spread that around the vines. We grew last year in that way more and larger fruit than we had from leaving the whole top of the vines. I cut them right back to sound wood. Experts came and examined them, and all agreed that it was the best method of treating them.

In regard to this blight spoken of, that is the result of the vines having too little vitality. If your vines are heavy and vigorous, I

don't think that will trouble them. I have observed, that when the vines are cut back in the way I have spoken of, they do not blight, and this method of covering I think will be a grand success.

Mr. Harris. Mr. President, I have been troubled with the blight and once I found it was occasioned by chintz bugs working on the berry. I don't cover raspberries, that is the blackcaps. I have found that the Doolittle and the Seneca will form their berries and promise a good crop, and then, with the hot weather in June, about in strawberry time, the berries will all dry up. The chintz bugs may cause the blight, and do with us some times, but it is oftener caused by the canes being somewhat injured in the winter.

Mr. Kellogg. Mr. President, I don't want to prolong the discussion, but I would like to call attention to the necessity of taking the plants up early in the spring before the buds form. If you leave them down until after the buds form, (and we believe in covering the whole cane), they are more tender; but if you take them up just before a cold night you may lose your crop. I lost a portion of mine last spring. Then after they are up, give them a thorough mulching to prevent drought in the summer.

Mr. Whipple. Mr. President, I have had a little experience with small fruit. I always have taken pride in the success we have had. Now, it is said that the Gregg and Cuthbert are the latest bearers we have; but for several years, since I have been growing them I have found they were out of the market before the old variety that we have had ever since I have been growing fruit, (and that is twenty years), was still on the briers. That the covering of the Greggs warrants the success that has been told, I fail to see. I know one of the most experienced men with the black raspberry—I think one of the most experienced in the State—last season left his customers, and I had to carry them along for over a week when he could not supply them with his Greggs and Cuthberts; and he has made up his mind that he is going back to my old raspberries, the old Philadelphia. I will venture to say that I can grow that longer, every season, with the same cultivation than you can the Gregg or Cuthbert. I can give you dates of our last sales, and the names of customers to show that it is still fruiting when other kinds are gone.

Mr. Cutler. I would like to ask if there is any member here that is residing in this part of the country that has had good success with the Ancient Briton blackberry.

Mr. Harris. The only gentleman that I know of that has been

growing the Ancient Briton for any length of time is O. M. Lord, of Minnesota City. He has had good success. I have seen his Ancient Britons and Snyders growing side by side. They are certainly a finer berry than the Snyder, and he gets more fruit from them.

Mr. Pearce. I would say that Mr. Shepard has grown the Ancient Briton for the last five or six years in large quantities; he keeps them all to himself, and I think he has made a good many thousand dollars from them. He lives here in Hennepin County. He has ten acres I think.

Mr. Gould. I was at Mr. Lord's place first in August and I might have seen his plants in September. He had those two kinds, Ancient Briton and Snyder, and as I was somewhat interested in them I asked as many questions as I could think of. I remember of asking him which he liked the best, and he didn't give any great preference as I remember, except that he considered the Ancient Briton a little the better producer. I was there again in October, and he told me that he was about covering his blackberries; I told him I was very much interested, and so he said he would light a lantern, and go out and cover some; he practiced this method that has been described here, that is of digging away from the root of the plant a little and doubling them down in a row. He commenced at one end of the row, bent them all in the same direction, and gave them a partial covering with earth. He makes a success with that style of covering.

Mr. Harris. I have had berries from his plants, and they are very nice.

Mr. Sias. Blackberry culture has been, until within a few years, almost a total failure. I recollect of seeing but two places where they were covered; one where they were growing the Ancient Briton the vines were well loaded with fruit. I am satisfied that there is no trouble about blackberries, provided they are covered in the fall at the proper time. Last fall I covered nearly all of mine for the first time.

Mr. Tuttle. I would say in regard to covering, it is necessary to turn them over in the way described, but not to cover them entirely; bringing them to the ground I think sufficiently protects them. Our canes are so large and so many in a hill it takes a good deal to hold them down, and I try to keep them to the ground. We went through last year and just put enough dirt on to keep them to the ground.

Mr. Wilson. I think success with blackberries depends a good deal on the kind of soil. I have seen them grown where I don't think more than one crop was obtained in five years, and they were covered.

It is most important to put them where they will stand the drought.

Mr. Smith. Mr. Kellogg has mentioned the kind of treatment that will always prove effectual. After you have taken them up in the spring, give them a thorough mulching; that will retain the moisture through the summer drought.

Mr. Harris. Mr. President, it strikes me that we have brought out about all we can until we get some papers on that subject, and I suggest we move on to some other part of the program, or else we will not get through.

REPORTS FROM LOCAL SOCIETIES.

The following report by J. E. Northrup, Secretary of the Hennepin County Horticultural Society, was then read.

HENNEPIN COUNTY HORTICULTURAL SOCIETY AND MARKET GARDENERS ASSOCIATION.

To the Secretary of the Minnesota State Horticultural Society.

The year of 1885 has witnessed a great development in the interests which form the aim of our Society. The membership has largely increased, the meetings have been well attended, the discussions animated, and the facts elicited therefrom, have been of benefit not only to the members of the Society, but through the reports of the newspapers giving the discussions in full, it is reasonable to suppose, that hundreds of farmers, and others interested in horticultural pursuits throughout the Northwest, have been benefited by its work. All this should serve to encourage each member of the Society to active and willing participation in its work; having in mind the fact, although it is not always encouraged as it should be, the work is no less effective in its results, or grand in its maturity.

The Society now numbers in membership seventy-six, in other words, has nearly doubled within the year just drawn to a close. At the fair held in Brackett's hall, Sept. 23 and 24, there were seventeen exhibitors of grapes, fourteen of apples, twenty-eight of vegetables, fourteen of potatoes, four of canned fruits and vegetables. A special premium of \$50. was offered by Mr. Henry F. Brown for the best display of fruits, the same being awarded to Mr. A. W. Latham of Excelsior. The special premium of \$25, offered by Mr. Gale for display of vegetables, was awarded to Mr. Wm. Lyons and Mr. H. F. Busse, first and second, respectively. In addition to these premiums of \$185 were awarded by the Society to exhibitors.

It is a matter extremely to be regretted, that I have to record the fact, that at the close of the fair, it was found that the receipts and the money in the hands of the treasurer of the Society were insufficient to cover the liability for premiums. This was owing to the fact that the Society was unable to obtain from the State, the money on which it had partially depended for the payment of its premiums. This was especially disappointing in view of the fact that, the Society had become incorporated under the name of the Hennepin County Horticultural Society and

Market Gardeners Association, in order that it might receive the benefits arising from the funds set aside by the State. And it was not until the share to which the Society was entitled had been applied for, that it was discovered, that owing to improper organization, it was debarred from securing the amount to which it was justly entitled. Steps are now being taken to remedy the difficulty, and it is to be earnestly hoped that before the next meeting of your Society, it may be rightly adjusted.

Despite the unfortunate termination financially, the fair was a grand success. The exhibition on a whole elicited on all sides, expressions of surprise, not only from visitors from abroad, but from citizens of our own County and State, to whom the exhibit was a revelation. It is an undeniable fact, that the showing of such a collection of fruits and vegetables does more to attract the attention of people looking for western homes than any other means that could be used. This fact alone, and the reflection that good is being done, not only in benefitting our State by developing its resources, but humanity at large by each new fact drawn out—of value—should be the reward of those who sacrifice their time and interests in this grand work.

The year 1886 opened with bright prospects. The meetings are held on Saturday of each week, at the rooms of the Northwestern College of Commerce, Prof. Asire principal, and thus far have been well attended.

At the annual meeting held Dec. 26, 1885, the following officers were elected:

President, J. S. Gray; Vice-President, G. H. Roberts; Secretary, J. E. Northrup; Treasurer, Prof. L. Asire.

Believing that the record of last year will be surpassed by that of the coming, I am sir,

Yours Respectfully,

J. E. NORTHRUP,

Secretary of Hennepin County Horticultural Society and Market Gardeners Association.

Mr. Pearce said the financial condition of the Hennepin County Society was by no means bad, though individual members had occasionally to come to its relief. Liberal premiums had been given, fifty per cent of which had been paid, and the balance would be paid within a month. The expenses for premiums, etc., amounted to about \$400.

The report of M. J. Hoag, Secretary of the Olmsted County Horticultural Society was then read.

OLMSTED COUNTY HORTICULTURAL SOCIETY.

To the Secretary of the State Horticultural Society.

In compliance with regulations in the interest of Horticulture embodied in an act of Legislature approved Feb. 28, 1883, I herewith submit the annual report of the Olmsted County Horticultural Society, its receipts and disbursements and abstract of its proceedings for the year ending December 26, 1885.

Pursuant to notice the 13th annual meeting of the Olmsted County Horticultural Society met in this city on the twenty-sixth day of December at 2 o'clock P. M.

A. W. Sias in the chair. Meeting called to order. Whereupon President Sias read his annual address which was replete with interest and encouragement to the fruit growers of Olmsted County. An interesting and congratulatory letter from S. D. Hillman of Minneapolis, and a highly instructive paper on entomology from the veteran pomologist J. S. Harris of La Crescent, were read by the Secretary.

Treasurer's Report.

Balance of cash on hand January 3, 1885,.....	\$ 9.70
Received for membership fees,.....	15 50

\$25.20

Disbursements,	20.90
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Balance on hand,.....\$4.30

M. J. Hoag, Secretary and Treasurer.

Officers elected for ensuing year: A. W. Sias, President; W. O. Crittenden, Vice-President; M. J. Hoag, Secretary and Treasurer.

Respectfully submitted,

M. J. Hoag, Secretary.

MINNESOTA VALLEY HORTICULTURAL SOCIETY.

A report from the Minnesota Valley Horticultural Society being called for, the secretary of the society, A. B. Regester, of Granite Falls, responded and said:

Mr. Regester. I have no written report, but I will, with your permission, give a brief account of our society. A little more than a year ago—I don't know exactly when, and I don't think anybody does—we had a succession of attempts and failures, in regard to the organization of a society at Granite Falls; but about the 14th of February, last year, we succeeded in organizing; we had at that time, I think, twenty-two members. About the middle of July we held our first semi-annual meeting. We had quite an exhibition of fruits, beyond what we anticipated, and the interest was considerable; and between that time and the fair in September, our membership had grown, until we had sixty-two members. We have now a membership of sixty-eight. We held our first annual meeting a week ago to-day. We only held one day, three sessions; we had a grand time. We had no exhibits or anything of the kind, but a good deal of interest was manifested.

But I am a little ahead of my story. At the county fair at Granite Falls, we had a horticultural department, the same as at our agricul-

tural fairs, and that created quite an excitement. There was a fine exhibit of small fruits, jellies and canned fruits of all kinds; and that stirred up an interest at that fair, and in about a day and a half, we gained forty members, by means of considerable work. A week ago to-day we had our first annual meeting and elected officers. Mr. O. E. Saunders was elected President, W. J. Rice Treasurer, and myself Secretary. The interest in horticulture among our people is increasing, and I think there is no doubt that between this and the next semi-annual meeting, which will be held some time in June or July, we will have about a hundred members, and we anticipate getting even more than that.

So far as the finances are concerned we have no extended report to make; we have taken in some twenty dollars and we have on hand a part of it, and a part of it we are using to-day in coming here and going home. I think that is about all I have to report; if Brother Saunders has anything further to offer he will do so.

REMARKS BY MR. SAUNDERS.

Mr. Saunders. *Mr. President, Ladies and Gentlemen:*

I came here as a stranger to-day, representing, with my friend Regester, our society at Granite Falls. He and my wife and myself were chosen delegates. Coming here as a stranger to all of you, with the exception of Col. Stevens, with whom I have had a pleasant acquaintance for some time, the welcome that I have received here has made me feel at home, and I feel that I am among friends. In regard to our society I wish to add just a few words to what Mr. Regester has said, and I wish to say that we have not succeeded in getting the society on the footing on which it now stands without some hard work. It has required some effort to get our people to work there. We almost despaired of doing anything toward the organization of a society. When the matter was first up for consideration, it was said by one of our leading men in that section that they had tried to organize a farmers' meeting without success, and a horticultural society would certainly be a failure; but that same man is now one of our most active members. He was at our meeting and I think he felt we were alive, and although our society might not be more than an infant, it is a healthy one and bids fair to live. [Applause.]

Now, I would say that interest in fruit culture in our section has been at very low ebb, but we are able to report to this body that there is an increase of interest up there. Five years ago I was told by

people there that I could not raise fruit—couldn't raise strawberries—and it was an impossibility to raise apples. But I was not discouraged; I came there, notwithstanding this report, and I have raised fruit in Chippewa County. The influence that a few have had there in persisting in this matter of bringing forward the claims of fruit raising has done a good deal to place fruit raising on a successful basis in these western counties up there.

Our meeting last Tuesday was wholly an experiment, and we didn't know how we would succeed. We arranged to have three sessions and we sort of made up a program. We put in enough papers we thought to fill up the time allotted with discussion. Every paper was presented, save one, and that was caused by the ill health of the person; and those papers elicited most earnest discussion. Every man was ready to respond to anything that was asked, and the discussions were so interesting that we had hard work to get them to stop. I expected that we should have some difficulty in drawing out discussion, but we had to put the brake on. When I was going to the hall in the evening, I met one of the editors of one of our papers at the door of the hall, and he said, "I am going to set out some fruit trees; I had been wanting to, but didn't know how to take care of them. I was into your meeting and heard your discussion and it brought out just what I wanted to know. Now, I can go to work in the right way." That is one instance of the good that has come of our society. You must understand, of course, that we have had failures there from inexperience and from the fact that our land is not in the condition it should be. It has not yet become thoroughly fitted for fruit culture but we are gaining ground and becoming more successful, especially in small fruits, and we feel confident that we will meet with ultimate success.

Mr. Sias. I have been very much interested in this report. I will say that I was present when this society was organized; also present at the second annual meeting. It seems that this new society is a larger one than ours during the first two years.

Mr. Harris. Mr. President, I have been very much gratified in hearing this very favorable report. It carried me back to those days down at Rochester, some nineteen years ago, when we were a weak and feeble little institution; and yet our Society has become a power in the State, and I think that it will grow till all our people are interested in horticulture. I would move that we furnish this new society at Granite Falls with one hundred copies of the report of this Society for 1885.

Mr. Smith. I was very much interested in the report of this Minnesota Valley Society; and inasmuch as it may encourage the members of this Society to do what they can in aid of local societies, I will tell you why. I went out to attend a farmer's institute in Chippewa County two years ago, and I met Mr. Shannon of Granite Falls, and I gave him a report of the Minnesota State Horticultural Society. After he had read it one evening he said he wanted a membership in the Society, and paid me one dollar and I gave him what back reports I had. About two weeks afterwards I got a letter asking me to write back, giving the form of a constitution; I did so, but in two or three weeks more he said it was no use, the people would not take any interest; but he kept talking it up, and last winter he attended our state meeting, and he said they were going to have a county society. That man was working over a year before seemingly accomplishing anything. Now, he has gone away from there, but here is a society of more than sixty members. These reports ought to be in the hands of farmers as far as this Society is able to put them. I simply throw out this suggestion for you to think about. This splendid showing in Yellow Medicine and Chippewa Counties is the result of good seed sown years ago.

The motion of Mr. Harris was then adopted.

Mr. Saunders. I didn't anticipate any such result, but allow me to present to the Society the congratulations and the thanks of the Minnesota Valley Horticultural Society for the very favorable notice this Society has taken of our society in that section, and as delegates from that society we will guarantee to do our best in distributing these reports where they will do the most good.

I wish to make one additional statement to show the interest that is being taken. Last Saturday, when I was waiting at the depot to come down here, I was talking with some of our citizens, and there was one gentleman asked me, "Why didn't you carry your meeting into the next day: you didn't get through; the papers were not half discussed?" We told him we had only made arrangements for one day, and couldn't very well exceed that. Another gentleman said, "The next meeting you must make two days; with the interest that was manifested, you will not be warranted in giving less than two days." You may think we feel a little pride in this matter; but I think it is a proper refinement of pride. We don't claim the honor for ourselves, but we believe that we are working in a good cause, and one that will redound to the good of the people, not only in a financial

point of view, but in the better health and the more wholesome food it will bring, and in the aesthetic feature of the cause, it will elevate the sentiments of our people by surrounding their homes with fruits and flowers.

Col. Stevens. I would state that I was at Granite Falls a year ago last September, I think it was, and I saw some very thrifty gardens there, and I saw some pretty good apples there too; I saw the Duchess and one or two other varieties that I didn't know, and the names were something new to me, and they were apples that were apparently comparing well with any that we had. Another thing I noticed in the neighborhood of Granite Falls, and that was their timber lands. I saw trees that had made a mammoth growth in one or two years. I was very much surprised to see the enterprise displayed by the people of that part of the State.

Mr. Saunders. You would have seen a better display there this fall.

Mr. Edson Gaylord, of Nora Springs, Iowa, delegate from the Iowa State Horticultural Society, was then introduced, and presented the following paper:

RICHARDING IN THE NORTHWEST.

By EDSON GAYLORD, Nora Springs, Iowa.

Mr. President, Ladies and Gentlemen:

We will use our best endeavors to confine our remarks to such points as we have proved to be of the most particular value in growing an orchard for home use during the past thirty years, leaving the commercial orchardist to care for himself. In touching so many points as we are seemingly obliged to, we hope to be excused if we appear to be dogmatical in our statements, for no one more than ourselves would more cheerfully stop, and give with the greatest pleasure the thousand and one reasons why we practice and advise others to try the following methods in growing an orchard here in the Northwest. The first apple trees set in Northern Iowa, so far as we have been able to learn, were set on our present orchard site in Floyd county. We then considered this site the best that could be found. After years of persistent efforts in setting and resetting we have been most thoroughly convinced that our site is one of the most difficult to successfully grow an orchard, that can be found in the Northwest.

Our soil is aspen, white and jack oak, elm, hickory, and black walnut, the first three proving best, the last three poorest. It was not till after many years of repeated failures that we could be convinced that our worst troubles came from a source we had so little thought of. Our orchard was so completely shut in and protected by thick, tall timber embracing some over five acres. The first twenty years we set and reset a few of all the leading kinds that came well recommended. Succeeded partially now and then, but more often failed entirely with many kinds.

Finally we stopped short and seriously considered the situation. We soon saw the little knowledge we brought west about growing an orchard was only a damage to us. This we demonstrated most thoroughly as soon as we went over the country comparing and examining the orchards and trees as we found them on all kinds of soils, slopes and in all conditions. Every tree bearing evidence of the most potent character, showing by its own conditions that there were certain conditions which would invariably bring about certain results, the conditions of different trees of the same kinds being almost invariably the same under the same surroundings. In short, certain combinations with similar surroundings almost invariably produced like results. Thorough and numerous examinations soon convinced us that what we had not learned about growing an orchard in the Northwest would fill a large book. Our first and most important discovery was finding many orchards on the bleak prairies on northern slopes, entirely unprotected or cared for by those who had but little knowledge and less experience in orcharding, doing fifty per cent better than those under opposite conditions. This soon convinced us of the truth and falsity of many theories we had formed while toiling in our orchards at home. What we had been so long guessing at we soon demonstrated. Our false theories went like brush to the bonfire, and our proved ones like choice wood to the wood house for future usefulness.

We would say first to the amateur, go and bury every idea or thought you have brought here from other climates about growing an orchard. This done, you have taken the first and best step on the road to success. Failing to do this, your blunders and failures will be endless. Second, secure your trees from reliable nurserymen who would much sooner lose the sale of their trees than their reputation for honest dealing. Unknown agents have swindled the Northwest out of millions of dollars, and as a rule those who have been the most successful have left with us the most worthless trash. Third, our first choice for a tree to set is one with extremely hardy stem, one grade more hardy than the Duchess, and grown on its own roots, top-worked three feet from the root with the best kinds which are as hardy, or nearly so, as the Duchess would be grown on its own roots. This will add full twenty per cent toward securing better quality than can be grown in any other known way. Fourth, our second choice is to have trees started on a two-inch root and a six-inch hardy cion, having the principal roots grown from the cion. We protest against two common plans: one, having our trees grown mainly on indiscriminate roots; the other budding into common stock grown from seed brought from Michigan, Ohio and New York. Either of these plans should be sternly rebuked, and will be by honest nurserymen. Fifth, give us neither wet nor dry soil. The advice so commonly given by writers to select a rich, warm, dry soil, often leads to bad results. Good corn land is all right, but extra good corn soil seldom fails to ruin an orchard sooner or later. Sixth, the best slope is northeast; worst, southwest; north is better than south; elevated lands better than low. Seventh, no protection on either side except south. Eighth, make your orchard self-protecting first by setting each tree in the second row south about two feet to the west of the one nearly opposite in north row, so as to have the south tree's shadow strike the north tree at half past one. The shadow of trees being much longer in Winter than in Summer, they will when thus set, shade and protect each other at the exact time and place they most need protection from the steady direct

rays of the sun which so seriously injure our trees during the cold, sunny days in February and March. Ninth, in Minnesota we would set trees fifteen feet apart each way. Set them from two to ten inches deeper than grown in nursery. Leave the hole on the bottom a little sloping to the one o'clock sun. This will help much in keeping a tree growing the same way. Be sure when setting to point the heaviest and thickest branches towards the sun at half past one o'clock.

Set them firmly; and as soon as the trees are about to leave out, cut all the leading branches on the northeast side, clipping in the ends of the twigs on the sun side with a view to close up all openings from the steady unbroken rays of the sun. Small limbs are seldom injured by sunscald and we have never seen a dead spot on a tree caused by the sun, unless the rays are unbroken for two hours and a half and never only when the stem or branch leans from the sun. Some think these dead spots caused by sunscald are always on the south or southwest side. We have often found them from where the sun strikes the tree at ten o'clock and all the way around three. We mean by this that a tree that leans northwest will be killed on the southeast side. If it leans northeast it will be killed on the southwest. If it leans southeast it will be found dead on the northwest side as far as three o'clock. These lessons are not only found in our orchards but all through the openings on the walnut and butternut. They are frequently found on the hard maple and pig hickory trees. Follow the above plan for setting and keep them so trimmed. One tree thus grown will be worth ten fine high symmetrically topped trees we read of so much. It is a fact known well to old observers that ninety-nine trees set as they commonly are with fine even symmetrical tops will at the end of five years be found making more or less to the northeast. And in making northeast they are making toward ruin. Grow such crops in orchards as will best prevent the ground from thawing out in winter or early spring. Many orchardists are recommending clover in orchards. We have serious objections to clover. It harbors mice and rabbits; it fails to hold the frost in the ground as even as other grasses; and what is worse than all we think it helps to produce blight. Potatoes we deem one of the worst crops to put in orchards for reasons too plain to need comment. We have tried high tops and low tops, now prefer medium. Think this is of less importance than when we set trees perpendicular. Now we would sooner have a tree with five feet stem leaning slightly to the southwest, or to half past one o'clock sun, than one with only one foot leaning northeast.

Eleventh, just how, when and why, our trees are so generally making to the northeast is still a disputed question. But that it is caused by the steady and uninterrupted rays of the sun during February and March, in nine cases out of ten we most firmly believe. This we argued many years ago but published nothing till 1879, in Iowa Report Book 1879, page 317. At that date no one living, as we have ever been able to ascertain, held the same views as we did. The next year Hon. R. P. Speer of Cedar Falls published his views (on page 151 and 153, Book 1880 of Iowa Report). We give now a few of the most prominent men who sustain these views: Prof. J. L. Budd, H. W. Lathrop, Jonathan Thacher, Suel Foster, P. M. Gideon, A. J. Haviland and a host of others are fast falling into line. We have observed and reflected much on the propriety of growing three trees in one hole. Twelfth, we have observed a number of such conditions in various orchards. Each top will diverge from the others and in doing thus, protect each

other much more than one would at first think. Thirteenth, we manure our trees when they are not making at least six inches growth. Also when we find a tree is very heavily set with fruit. Without this in either case the tree would be liable to starvation and death. Fourteenth, we mound up with about half a bushel of earth to each tree in Fall, to protect from mice, and we prefer to leave it there through the Spring to prevent the round-headed borers entering the bark as they always do near the collar of the tree. The mouse very seldom climbs up a mound of clean earth to gnaw a tree. Fifteenth, to protect from rabbits, we set an old-fashioned box trap baited with sweet apple, carrot, or corn, or hunt his hole and drown him out with two pails of water turned suddenly into their holes; if in the ground, will bring them up quickly. We often whitewash the trunks with a mixture of lime, clay, sulphur, and snuff, with good results. Tie newspapers about trunks, but never use tarred paper.

STOCK IN ORCHARDS AND BLIGHT.

Of all stock in orchards the pig takes the lead. His omniverous instinct leads him at once to duty and usefulness. Our most injurious insects are hidden in the imperfect fruit which falls prematurely and when left as it commonly is will bring forth and multiply to an alarming extent. All secluded nooks and corners, old piles of rubbish and bunches of brush with grass and weeds grown up through them form the insects' paradise. The pig possesses a wonderful degree of push, search and research; in fact there is nothing so finely hid that his constant search will not find out, upset, turn over, root to pieces, scatter, tramp out of existence. And if the old sod needs stirring up and renovating he will do it without being coaxed or told. He is a most willing servant in his place; and that is in the orchard from spring till time of gathering; and then immediately after.

Some say he is unbecoming in the orchard, but we have not unfrequently felt more indignant toward some pigs who never were so favored as to have the use of as many legs as the one here referred to. We say of blight for those who are troubled by it: Seed your orchards to blue grass or timothy; remove all protection; keep away all manure; cultivate but little, and mulch thoroughly with light material, straw, tomatoe, or potato tops, fine brush or evergreen boughs. For particulars see our article in *WESTERN RURAL* on Blight. Our views have not been changed since then. We do not hold to the common idea that some in Minnesota do, that the Transcendant engenders blight and then sends it to its adjacent neighbors; while many think its conduct will warrant them in so believing, we feel sure that the evidence when better examined will not sustain such belief. The worst blighted orchard we saw on our trip of five days observation the first of July last, was one facing south shut in close by groves and buildings on north and east and was literally a feeding lot for a host of hogs and had been for some years in the past.

We mulch when the ground is frozen in early winter to keep the sap dormant till proper time for trees to start in spring. In 1884 we mulched with six inches of snow and three inches of frost. We then doubted the utility of our mulching with so little frost in the ground. In January we thoroughly examined our orchard in

all parts with iron bar and found no frost. Think our mulching did more evil than good as it kept the ground too warm in winter and spring and the sap more active out of season. In the fall of 1884 we had so far conquered the uncongenial conditions by our new methods of setting, trimming and top working that even from our worst of all orchard sites we sent to New Orleans the finest specimens of Wealthy, Wolf River, Dyre, Fall Orange, Pewaukee, Bennonia and many others of like quality. We then felt that we were only one round below Pomona, even then we had our arms raised to embrace her. But spring came and where was our ladder we had labored from early manhood till old age to build. Alas every round nearly to the bottom broken and fallen all in one rude heap, with a world to pity but no hand to save. Now as Buddah to Kilvana said, nothing can save a child that's dead.

PRESENT OF ORCHARDING IN NORTHWEST.

To say that we are plunged in a gulf of dark despair would but feebly express the sad condition we are in. No soil, slope, setting, leaning, trimming, protecting, exposing or mulching, has saved our orchards. But there appears before us a new lesson, and difficult as it may appear to us, we must search it out before we can reach the goal of success in the Northwest. Nearly everybody looks upon the causes of our calamities as something entirely new; we do not. It is only a new combination of the same old troubles we have been battling for years, viz.: excessive cold and untimely heat. We have studied this much, and differ with many. We have held for many years that our principal trouble has come mainly from untimely heat rather than excessive cold. Cold injures and kills many tender trees and shrubs but always shows first at the tips, keeping pace with the thermometer in its downward course. In excessive cold, the twigs of some kinds we call hardy appear to be injured but in this case the balance of the tree will remain uninjured. We have shown our most hardy kinds to be much more discolored in the twigs when the mercury sank no lower than fifteen degrees below zero, than they were last winter with mercury below forty. The true cause of our present disaster lies in the fact that the various elements were combined in an unusual manner. The snow fell before the ground had frozen. Potatoes growing wherever we grew them the Summer before. We have seen the like in other climes but never before here. Have known the snow as deep, have seen it go off with the sun as late, have seen it unfrozen when the snow fell, have seen it drift as little, but some of these conditions were differently combined from what they were in the Winter of 1884 and 1885. Orchards received their first shock from a warm spell late in the Fall before the ground froze. Nextly, warm sunny days in February and March which melted the snow and settled it much, calling up the sap sunny days and suddenly freezing it nights while up. This was often repeated. The first week in May we had a very warm spell, everybody was hurrying up for planting. Some had planted, but on the 7th of May, when the blossom buds began to show red on the crabs there came a remarkably sudden change. The northwest wind came sweeping down from the way of Manitoba, making it so excessively cold that we could not run our planter for cold and frost. These conditions continued three days unchanged.

Water tanks that had been uncovered froze up worse than they had been during the whole winter. We had to chop the ice out of our watering troughs for stock to drink. This was the third and last shock, and how could we have expected anything more than a general destruction? Here we beg to insert two items which have come under our immediate observation. We have hundreds of others to demonstrate the position we have taken, that cold is not king in the destruction of our hardy trees. John Cline, of Panora, Iowa, has an orchard with two ridges running east and west through the center of the orchard. Has some ten different varieties in rows running north and south over the ridges, and across the two sags; the snow blew off these ridges, settled in the sags, freezing on these ridges and not in the sags. Each of these varieties as they passed over these ridges were left alive, those in the sags (with ground unfrozen) of each variety all died. Andrew Peterson, of Waconia, Minn., west of St. Paul, on an exposed, high, elevated site, takes all the premiums on apples at this meeting, in Jan., 1886, while J. S. Harris, down in the southeast corner of Minnesota, in a snug, cozy, protected site, close surrounded by the Mississippi timber, her high bluffs, and high ridges, with all his care and skill, which is not equaled by anyone in Minnesota, if in the Northwest, has not the first apple on exhibition. For many years in the past he has had the honor of carrying off the great share of blue ribbons. If our theory is not correct then Mr. Harris' place must have been the coldest, and Mr. Peterson's much the warmest. We have facts without end to show that the same varieties of trees grown in thicket form, or under protection from sun have come out entirely unharmed, while those on same soil and same conditions as to site (excepting their exposure to the warmth of the sun), have been killed dead.

If it was untimely heat then let us be prepared to guard against the like in the future, which we can. But if excessive cold, as many affirm, we are lost with but one road left to retreat and that across Behring Straits.

We examined the twigs nearly every week from December till May. We found the tender kinds killed back, some more, and some less, some to the ground; but our well known iron-clads were only slightly discolored leafing out nearly to the ends of the twigs while their trunks were badly discolored. We trimmed every month all Winter to test winter pruning; observed no discolored wood until the last day of February in the trunks. Now if cold was king will some one answer a few questions: 1. How the bodies of our most hardy kinds showed more injury than their twigs, and why such kinds should leaf out almost to the last bud? Why were chestnut trees standing single, ruined while those near by standing in close thicket entirely uninjured? This answered, will you next tell us how it happened that one orchard in our township facing north had always been up to 1884 and 1885 remarkably thrifty and productive, while the other cornering this but facing south had been one of the poorest but came out last Spring full the best? Why, says one, that is perfectly easy to answer. The one facing north without any protection received the greatest amount of cold. So we thought the first time we examined these orchards. We felt then that all our labor to show that trees the most exposed to cold came out of winter the best was scattered like chaff. We had for years held this north orchard as being one of our most conclusive evidences that a cold slope without protection was better than the opposite conditions. After studying these conditions in these two orchards a few days we went and re-examined them

and learned the one north had been left the summer before to grow up to a heavy thick growth of grass and that it stood undisturbed all winter. The south orchard was planted to potatoes and other light crops such as left the ground nearly in a nude condition. Here we saw the whole thing in a nut shell. What we thought had ruined our former arguments on this subject you now see turned out when properly investigated to be one of the strongest evidences in favor of our position. The snow coming as it did caught the north orchard entirely without frost in the ground, holding the roots all the time in readiness to send up the sap at the first call of the sun. The same sun that melted the snow called up the sap day after day and at the same time freezing it solid at night. The sap passing up in the inside as it does and coming down on the outside in the inner bark and sap wood growing thinner and cooler as it must in its downward flow, would as a matter of consequence commence to stop by freezing outside at least a few minutes sooner than the sap would stop pressing up on the inside. This action would cause a superabundance of sap to gather on the inner bark on the trunk which by sudden and severe freezing would cause the bark to loosen from the trees, as was the case with many trees in this north orchard. The south orchard being nearly clean ground froze some three inches just as the snow commenced falling, which helped to keep the ground cooler than in the north. Had we all gone to work and cleaned the snow away from the trees as we talked of doing a number of times during the winter we have no doubt but that our trees would have come out last spring.

That we may not be misunderstood on this great and leading point now so much attracting the attention of the progressive orchardist, particularly throughout the Northwest, first we say, we do not pretend to claim that excessive cold alone does not kill many tender varieties. This we admit. But we do not admit that the most hardy kinds are injured as much from excessive cold as from untimely heat which starts the sap out of season, and suddenly freezing catches it up in the tree above ground or above snow line, and in this condition the sap wood and inner bark are so much and so suddenly enlarged from their normal condition that the sap cells are so broken up and injured that death follows. Any unusual warm spell followed by a sudden freezing at such times as when the leaves are off in fall or winter, or when they may be partly formed in spring is almost sure to be followed by disaster, particularly so if the ground is not frozen when the warm spell occurs.

Orchardists should consider here in the Northwest how best they can secure the freezing of the ground early in the fall and hold it so till time for trees to leave out in spring. Our plan is to seed to grass and soon as the ground is well frozen en mulch thoroughly.

The ground in 1884 and 1885 was not frozen from fall till spring but very little, and this mainly where the earth was by accident or in other ways made bare.

FUTURE OF ORCHARDING IN THE NORTHWEST.

Shameful ignorance and alarming stupidity, has marked our path while attempting to produce choice, hardy apples here in the Northwest. Look back on our track and see how uncertain and unreasonable has been the course we have been pursuing till recently. The seed to grow our stock, for roots to start the kinds we now have have been grown in Michigan, Ohio or New York; not one in a thousand proving valuable as standard trees. These results are nothing more than we

should have seen long ago. You say you did, but how could you have helped this since this was your only choice? This you say, you had to accept or remain idle, and who, in all this Northwest ever saw an idle or lazy horticulturist? Such conditions are not in the nature of his surroundings. If any set of men have ever followed the old moth to try, try again, it has been the orchardists of our Northwest. But his misspent energies and wasted means have brought him to penury and want. He has been forced to fall back on his resources and use the most rigid economy, or take to other callings. No one need envy the wealth any orchardist has gained in the Northwest. We would deem it no more than an act of justice should the State of Minnesota exempt from taxes each forty acres which shows five acres of orchard property set and cared for during the next five years. The State should take the matter in hand of experimenting and growing new varieties of apples, plums and other fruit. This play of chance should be played out. It has wrought the ruin of many of our best citizens. We have been lo, these many years striving to procure valuable kinds for the Northwest by planting seeds from such tender varieties as have not had the least shadow of a chance for success. We have tried long enough to get the kind of blood we so much need to make orcharding a success in the Northwest. We have not once stopped to reflect or reason on what we were doing or how we were doing. Like children we have been playing blind man's buff, catching at this and guessing at that. We advised many years ago to grow no trees for the Northwest except from seed grown in Minnesota. Had this course been pursued we should at least have had more hardy kinds than we now have and much superior in value. To be convinced that we were pointing towards a more direct road to success, you only need to examine the results of the well directed labors of C. G. Patten of Charles City, Iowa, who took up this same train of reasoning some years ago and went to work with a well defined object in view. He selected seeds from the best hardy kinds grown there, and now he has a show of fruit and hardy trees that will surprise any orchardist in the Northwest. Some of his trees are heavy bearers, good in quality and perfect models of trees as to hardiness. The contrast they show, surrounded as they are by all of our old standard varieties which scarcely have life sufficient to leaf out the coming spring, is truly worthy of a personal inspection by any interested in growing new varieties from seed.

Apple trees grown from seed grown as far north as Minneapolis, would give us a good chance from which to select such hardy stock as are at least one degree more hardy than the Duchess, and *on such stock* we could grow with reasonable success such choice varieties as have been grown *on their own stems* as far south as the center of Iowa. This course would advance your chances of success at least twenty per cent beyond any other direct way now known. Many individuals have been pursuing this course the past few years with marked success. But bear in mind the stem and root must be extremely hardy to make a success of this plan. The Wealthy in northern Iowa top worked on crab stock have borne us a good crop this season, while on their own stems very many have failed entirely with only now and then a tree on its own stem that has borne any more than to keep up the credit of the tree. Here we come to a full stop and find ourselves switched off on a side track with little other show than to remain, except taking to the long circuitous route which would take us through centuries of labor in acclimating the more

choice varieties to endure the sudden and extreme changes so common to the Northwest. Our direct road to success is through the Russians some of which will prove hardy, fair keepers and passable in quality. But our richest results will be brought out as we believe, through some course not wholly unlike the following which we here sketched for your careful consideration. For site select the most favored location known in America where the richest and choicest kinds can be successfully grown. But to secure the finest flavor and better assist nature in acclimating the new seedlings to the Northwest, we would fix the site on the northern limit of sure success. Select sound, vigorous, healthy trees, two or three of the best standard hardy kinds, and top work each with three or more kinds. For Minnesota use the best Siberian, the best Minnesota seedling and the best long-keeping American apple known. Those whose identity has been thoroughly established for hundreds of years both for keeping and for quality. These combinations could be so formed as to suit almost any taste and all future requirements. Then just as the trees were about to blossom we would have a frame so made as to readily receive a fine wire screen which could be fastened on leather strips so as to roll up and unroll as the occasion required. These screens could be painted white to keep them from rusting as well as reflecting too much heat. They would only be needed some ten days when they could be taken off rolled up and stored away for each successive year. This would effectually prevent the chances for the trees thus protected being pollenized by spurious kinds through the agency of bees and other insects. But to make this plan sure and complete there should be no other kinds growing near on the outside for fear the pollen might find its way through the screens. While these are our best thoughts on the subject, we have no doubt but that there can be many amendments made to these suggestions with profit. A swarm of bees might be placed in each apartment to insure more perfect mixture of the pollen. When the fruit is ripe the seeds should be saved and sent as far north as Minneapolis to be grown and cared for properly. By doing this we would soon learn which of the fittest would survive. The south side we would board up tight and let it so remain the year through. This would protect much from untimely heat in spring, from oppressive heat in summer as well as from the direct rays of the sun in February and March which causes sun scald.

We have the strongest confidence that some plan similar to the one we have attempted to describe would lead us directly out of the wilderness and at once secure to us much more valuable trees than we have secured through all these many years of struggle. Trees that have commenced bearing could be secured, and the work commenced at once, and rich results would follow one after another in quick succession. We think this plan simple, and perhaps it is too much so to attract your special attention, but if you should deem it practical then we shall not be sorry for making these suggestions on this the most important part of all that pertains to success in orcharding in the Northwest. It appears to us that one thousand dollars a year would cover the entire expenses for ten years to come; and at the same time relieve the thousands who are now wasting so much time and money on foolish and unwise experiments such as have brought so much ruin and failure over the Northwest. If the great State of Minnesota cannot be induced to lead out in this alone let her make the effort to join with Wisconsin and Iowa and divide the seed and grow each its own as it may deem best

Mr. Harris moved that the Society express its appreciation to Mr. Gaylord by a vote of thanks for the paper, and that he be made an honorary member for the term of five years.

The motion was adopted.

Mr. Gaylord. Gentlemen, I rise to thank you for this mark of your appreciation; and I can only say that I will be very happy in returning the compliment by doing what I can to see that you are well treated by our society should any of you visit us. In Iowa we are interested in helping you along as far as we can, for we are working under similar conditions, and your labors have been helpful to us.

THE BLIGHT QUESTION.

Mr. Whipple. I would like to ask you in regard to blight, whether it is still existing in Iowa.

Mr. Gaylord. The blight is not in my orchard although it used to be. It is in others. I think I have got one of the worst places for blight in the world; I have never seen any place that I thought could beat it. If you want to produce blight I will tell you the most certain way to do it. I would select a warm place, lying to the southwest, shut in by timber; plow and cultivate well, manure thoroughly and set out your trees; and then with a long, warm, dry spell in June, followed by rain, about two showers a day, and I would be sure the trees would blight. Now, if these are the worst conditions for producing blight the opposite is the best. I want a northeast slope for my trees. I believe it is a miasmatic poison, something similar to that which rusts our wheat, rising like an exhalation from low ground; it will come up similar to a fog; not moist like a fog, but dry. I don't know how I can better explain what I mean. I have studied this subject a good deal. It seems to be a dry substance which rises from low ground and is carried along in currents by the air. When I say a current I don't mean a wind, but if there is a little air moving, there it will attack your trees. There are certain trees that are more subject to blight than others. In Minnesota you are troubled with blight more than we are, I think, from the fact probably that you have very short, warm summers; your trees grow fast; you take care of them and give them protection to keep them from these cold chilling blasts of winter. Everything grows here much more rapidly than further south. And as you shut your trees in more, you furnish the most inviting conditions for blight to work in.

Mr. Whipple. Do you consider blight something that certain localities are especially subject to, or is it something that will finally pass away.

Mr. Gaylord. I think it is something that rises on every man's farm, and comes from the specially favorable conditions to be found.

Mr. Whipple. We have a little different history. The first appearance here of blight was where the city of Minneapolis now stands, and it has traveled west. Out where I am, fourteen miles from here, I used to have it in my orchard, but it has disappeared. Some trees have been nearly killed. Other orchards close by were not affected by the blight the same year. It seems to me that blight has been in the country about fifteen years. But I believe it is something in the air that will pass away after awhile. In my orchard there was no sign of blight this last year.

Mr. Gaylord. Another thing that affords a favorable condition for blight is the rapid growth of our trees. A tree will grow five or six inches in a week's time; the twigs are then very tender and that accounts for this dry, miasmatic substance striking the leaves and holding to them, and its being most destructive to the new growth.

Mr. Whipple. If that theory is correct, I would like to know why, when we were troubled with it here, it wasn't known some fifteen or twenty miles west of here. It is on trees further west, twenty or twenty-five miles west from here. If it is in the atmosphere and certain conditions bring it on, why does it not trouble us one year as well as another?

A Member. Another thing about blight, if you commence cutting off the blighted part, you will kill the tree, I don't care if the tree is a foot through.

Another Member. I let them stand the first season, and cut off the blighted part the next year.

Mr. Tuttle. I have never found any man that fully understood the cause of blight. I have talked with Prof. Berry and others, and they all agree that it is something that comes and goes. We don't know why, and we don't know when it will disappear. Mr. Downing said it appeared in his vicinity, quite a number of years ago; it left there, and for some thirty years it has not returned. I know in Wisconsin for more than fifteen years we never saw anything of blight. I don't know why we didn't have the same state of atmosphere then that we have had since. The first appearance of blight was on the Talmon Sweet apples; it was not confined to them, but

it was generally found on the Talmon Sweets. It was confined principally to that variety. The next year it took other varieties, while the Talmon Sweets didn't blight. It has been changing from one variety to another, and now it seems to be nearly worn out. There are some trees that are more liable to blight than others; there is the Montreal crab, and the Alexander, a Russian apple that are subject to blight. In regard to shelter, I have seen the worst blight where there was no shelter. I have seen Transcendent apple trees killed to the ground that were standing 500 feet higher than others that were not affected. The style of blight was the worst I ever saw on any place. In another place on the north side of the orchard, several Transcendent trees were as badly blighted as any I ever saw. I know that blight spreads. The same thing is seen in the oak. The black oak blights the worst generally. I had a fine oak grove, and for two or three years the blight was gradually spreading through it. It is going through it again now, in the same direction, moving northwest, and it will go through the whole grove. It is something that comes and goes. We don't know the prime cause of it. And certainly, I know of no remedy for it, unless it is putting your orchard into June grass seed. I think very likely that is the best remedy. Of course, the effect of blight is to destroy the tree so far as fruiting is concerned. I have a number of trees that were affected with blight; this year they died. But I haven't been troubled a great deal for the last ten years. Commencing on the present year's growth, I cut off all that is ruined. Where I see a black limb, I cut it off. It will stop the blight for that year. But I don't know of any remedy; I don't know what you can do with it. I think it is wearing out. I believe that we shall finally be rid of it, and in fifteen or twenty years we will be without any blight.

Mr. Nobles. I have a small orchard, and several of the trees blighted. I examined them, and cut off a limb, and found a little worm about an inch long. I have about seventy-five trees that I set out several years ago. The blight killed a good third of them, but did not kill many of my Transcendents.

Mr. Gaylord. When my trees are not looking well I put a little manure on them, or a heavier mulching. If they have all they need I put on ashes. Manuring will never hurt a tree except when it is loaded with fruit. I never knew trees to blight when I tried that. I use chip manure.

Mr. Nobles. I think that white-washing the trees will keep them

free from blight. I put on white-wash and a little clay with it.

Mr. Busse. I set out fifty trees eight years ago. I put a row of currant bushes between the rows. By working thoroughly I kept them clean. In two or three years they got from a foot to a foot and a half growth. I think it was in June 1880, they commenced blighting. I cut off the blighted part. They didn't blight any more that season. The next year, early in the spring, I put about half a barrel of salt around them within about three or four feet of the trees. I did that for two seasons and have not been troubled with blight since. At the same time a neighbor close by is troubled with it yet. I would say that the Iowa gentleman is very correct in his remedy, if he does not choke the trees too much with manure.

Mr. Somerville. I wish to say a word in regard to blight. I am not going to discuss the cause of it, but I wish to tell of the preventive used in my orchard. I had a large orchard of crab trees which were affected with the blight. I thought I would either destroy the orchard or get rid of the blight. I seeded the orchard to red clover, took the rings out of my hogs' noses, and turned them all in there. They rooted the ground all over and over around the trees, and since that time, for four years past I have not seen any blight.

Mr. Sias. It seems to be admitted that no one knows exactly what this blight is. My opinion is that it is some kind of living organism that gets into the cell structure of the wood. As Mr. Busse says, I believe that salt is a good thing to throw around trees if you don't throw it over them. You are very apt to kill the tree if you throw salt on the top, but throwing it around the roots I think would be a good thing. One gentleman recommends lime. Ashes, sulphur, and kerosene, anything that will destroy these minute, living organisms is beneficial. I believe it is something that moves in the atmosphere, as Mr. Gaylord says. It floats in the air slowly, and lights on the different trees, and runs in streaks through the country. Some years it is a great deal worse than others. A great deal depends, he said, upon where the orchard is located. I believe in wind breaks myself, but not in hemming in too close. Usually where I have seen blight was where I thought the trees were hemmed in too close.

Mr. Kellogg. Mr. President, I know of no subject that is so inexhaustible as this subject of blight; if you get out of timber, just take up this blight question.

THE DWARF JUNE BERRY.

The following question was then read:

Does any person know anything about the Dwarf June Berry, and is it worthy of cultivation?

Mr. Gaylord. I think it is what we used to call the Shadwood or Shadberry. I have a few trees from one of the best nurserymen in Iowa. They produce a very small berry. They don't amount to much except for the birds to eat. I have grown just enough to have a few berries to eat.

Mr. Smith. It makes a very pretty tree for a garden or lawn; the berries are small and of no particular value. There are quite a number of them in this city set in gardens. They are not as large as the common June Berry.

Mr. Harris. Mr. Gaylord, I think, has given us all the light we will get on it. It is recommended by men that are peddling it as very desirable, and the berries equal to huckleberries; they are selling the plants at a pretty good price. I don't think they are of any value except to feed your birds on.

Mr. Gaylord. It blossoms very early. The birds feed on the berries and like them, but for eating it is about as poor as anything you can get.

Mr. Sias. I supposed we had the common June Berry and the Dwarf June Berry growing wild in our county. I have heard considerable about the Dwarf June Berry being a good and fine fruit, and last fall I took pains to look around to see if there was any in our section. I found a good many, bearing pretty well, some of them I couldn't see any difference between the fruit of those called the dwarf and the common species; they were generally small. The fruit is about the size of a pea. I couldn't see any advantage in the dwarf over the common species, and I doubt if they have any large fruit such as they recommend.

Mr. Smith. The only particular difference I could see is in the size; the dwarf only grows about three or four feet high, while the standard grows to some height; they grow all along the road.

THE BLIGHT QUESTION AGAIN.

Mr. Harris. I would like to say a word about this blight question. I used to think I knew something about horticulture, but I don't think anyone knows very well what blight is. But my opinion is that what is called blight is a living ergot, or parasitic fungi, which

propagates itself and is carried in the atmosphere; it will propagate on our fruit trees. I have noticed that if we have a warm, dry spell just before strawberries commence to ripen and then directly a succession of warm showers, as Mr. Gaylord spoke of, I have known trees to make a growth of six inches in twenty-four hours. These shoots are full of water, and are just in the right condition to be affected by blight. It attacks the Transcendent first, then the Duchess, and everything else on my place. I believe where the wind works freest it is the least liable to find a lodgment, because years ago when I set out my orchard I set out a windbreak and at first when the windbreak was small and the wind coursed freely through it, I didn't have any blight, but it grows worse and worse every year. I have tried salt; it hasn't cured my trees of blight, but I find it is beneficial. It helps them to withstand the drought and makes the soil hold the moisture.

Mr. Smith. Two years ago I recommended hanging open cans of kerosene in the trees, as a remedy for blight, and I think it is an excellent remedy.

Mr. Harris. We have a blight, so called, that is caused by a twig borer. I have seen a little of that, but it only comes once in a good many years, and is not a permanent thing.

Mr. Nobles. I would like to say here that I have some apple trees closely hemmed in with cottonwood and maple trees and I am not troubled with blight. I have cultivated them for twelve years, and my apples bear every year; I have some trees set in the door-yard that are the nicest trees I have, and they were loaded with fruit this last year.

Mr. Gaylord. There is an insect of that kind; but it is not this common fire-blight; that is given up, I believe, by all our best men. Insects will work in after a few days. Where the blight touches the sap it fomented and works, and draws insects to it.

Mr. Harris. You can almost see that kind of blight grow. Take it about two o'clock in the afternoon after a shower, and after examining it a little while you can observe a change; the progress is almost perceptible, it grows so fast. In this kind of blight I have seen the insect that produces it.

Mr. Nobles. My orchard on the south and east is protected by soft maples, and west by cottonwoods, but if I was going to plant again I wouldn't have a windbreak within twenty rods of my trees.

When I first came here I was told to set them close to my trees; I did it but I wouldn't do it again.

Mr. Tuttle. I have had pear trees blight in a field, on ground that never had been cultivated. It was an idea we had several years ago that pears on cultivated ground wouldn't blight. I have trees on cultivated ground and uncultivated, and I can see no difference. They blight just as bad in one place as another. When a pear tree blights it is one of the worst of trees. We used to grow trees that never had a particle of blight, that bore good crops of fruit. I have trees that never blighted a particle, that are twenty-five feet high. I believe trees, generally, after they bear good crops, to be more liable to blight, but I have little faith in varieties that are originated in this country. If I had as much faith in the Russian pears as I have in the Russian apples I would look no further. I am trying the Russian pear; it seems to be perfectly hardy, but whether it will stand the blight, is a question to be found out hereafter.

On motion, the meeting here adjourned till 7 o'clock P. M.

EVENING SESSION.

TUESDAY, JANUARY 19, 1886.

The meeting was called to order at 7 o'clock P. M. by President Smith.

A paper by Wm. McHenry, on Blackberry Culture in Minnesota was read by the Assistant Secretary. Following is the paper.

BLACKBERRY CULTURE IN MINNESOTA.

By WM. MCHENRY, St. Charles.

Mr. President, Ladies and Gentlemen:

As it is impossible for me to be with you at this meeting and feeling a great interest in the cause of horticulture, I will try in a brief manner to comply with the wishes of your Secretary and others.

My motto is "What one man has done another can do."

What varieties of blackberry are best adapted to culture in Minnesota? or have we any variety hardy enough to bear well in Minnesota without protection? I answer No, if so trot it out, for it is worth "millions."

I know when I make the above assertion I tread on many corns, for nurserymen's catalogues are full of testimonials of certain kinds that need "no protection;" and yet which it is alleged bear immense crops of luscious fruit. There are few of my

hearers, perhaps, that have traveled more miles the past year than I have, having visited one field of seven acres, and having sought practical information on this subject from every available source.

We are deprived of raising many of the most lucious of the larger fruits, and even apples, in many localities are a failure, as I could show you orchards in this vicinity where even the Duchess was killed last winter. And yet I have now on my table a catalogue containing testimonials reading like this; permit me to copy one :

"The Stone's Hardy Blackberry came through last winter without injury, without protection, although the mercury was forty degrees below zero several times. It is evidently an iron-clad."

This catalogue has two pages of such testimonials. Now, this man has a large patch and should have picked one bushel to the picking, and he told me he only picked one box at a time, (and yet they need no protection;) further his berry patch is very favorably situated, being surrounded by a willow hedge, also plum thicket, and other trees among the bushes, so that the snow piled in there nearly to the tree tops, yet he says this is "no protection." He only had a few berries.

But to my subject. Stone's Hardy is the best adapted to protection of any of the high bush varieties though there may be some of the dewberry family that might do well. It is a very rank grower yet it has a slender stalk, throwing its vigor more into side branches; it does not grow tall, and yet gives more fruiting wood than any other variety, which accounts for the immense crops of fruit produced. Hence it can be laid down for protection without breaking but few bushes.

The Snyder is also a vigorous grower sending out one very coarse, tall stalk with but few side branches, which accounts for its light yield of fruit.

The Ancient Briton, which has so much said in its favor by growers, is much like the Snyder in its growth, but has more side branches, hence it has more than double the amount of fruiting wood, but it breaks very badly in covering. I also have other varieties but do not consider them worthy of notice here.

MODE OF CULTIVATION.

I would prepare my ground by manuring heavily and thorough cultivation; then mark the rows eight feet apart. After the row has become established, or has been set two years, I would have the row one foot wide, and if I could would have a double row or have one bush to every six inches of space in the row; and thus the plants will stand one foot apart. It is best to keep the suckers down if you want choice fruit, this is easily done with a horse and cultivator. We often hear of blackberry patches that blossom full but the fruit dries away. We have had no such trouble with our mode of culture. As soon as the young bushes get eighteen to twenty-four inches high pinch off the tops of the plants and pull out where they grow too thick; this should be kept up for one month at least, or until about the time the berries begin to ripen.

PROTECTION.

As we have plenty of bagasse at hand and are glad to get rid of it we take a wagon with hay-rack on, putting on a long neckyoke. Load our wagon and drive astride the row and the wagon will bend the bushes all one way. One man on the wagon forks the bagasse off on the bushes; one man on the ground with a pitch-

fork in hand sees that all the bushes are held down and covered. In this way two men with a team will cover about one acre in three days. In the absence of bagasse I should use straw in the same way; or even coarse manure will answer the same purpose. Some recommend cutting the roots on one side of the bush, bending down and covering with dirt. I have tried this with very poor success, as the bush needs all the sap it can get to mature its fruit. I left one patch last winter of the Stone's Hardy without covering, but did not get a pint of fruit where I should have had a bushel had they been covered.

REMOVING COVERING.

As it is necessary to mulch your bushes all you have to do is, as soon as freezing weather is done, have two men with forks walk on each side of the row, removing the covering from the bushes; raise them up with the fork and place the covering under, or as nearly as you can get it; this keeps the weeds from growing among the bushes and also protects your fruit from being injured by drouth; the rest of the cultivating can be done with a horse.

TIME OF RIPENING, ETC.

We first went into blackberry culture with many doubts. Hence we only set three rows fifty rods long. From this patch we sold last year over one thousand quarts of very choice fruit at twenty cents per quart, and estimated over five hundred quarts on the bushes when the frost of September 1st harvested the balance. We have so much faith in blackberry culture that we have now three acres, and shall double that amount as soon as we can get the plants. I should have said our rows were not full, and we now have bushes enough on the three rows to double the yield of 1885.

As to the time of ripening of the three kinds above described, I would say, that we commenced picking Snyder August 1st; Stone's Hardy August 10th; Ancien Briton August 20th. September 1st, Snyder all gone; Stone's Hardy had but few berries left; Ancient Briton had not yet reached their best.

QUALITY OF FRUIT.

We had many visitors and with but few exceptions the verdict was in favor of Stone's Hardy. Any of these varieties are good enough for me.

A paper on Grape Culture, by Silas Wilson, President of the Iowa State Horticultural Society, was then read by the Assistant Secretary. Following is the paper:

GRAPE CULTURE.

By SILAS WILSON, Atlantic, Iowa.

Mr. President and Members of the Minnesota State Horticultural Society:

By the kind solicitation of your Secretary I have been induced to prepare a short essay on the grape.

Grape vines are among the most variable plants. Even in their wild state, in climate, soil, shade, humidity, and, perhaps hybridization, have originated such a multiplicity and such an intermixture of forms, that it is often difficult to recognize

the original types and refer to the different forms to their proper alliances, only by carefully studying a large number of forms from all parts of the country, and after all this, we can only recognize the Labrusca and Reparia families of the grape as the only source from whence we get our valuable grapes. I have no faith in grapes of any other parentage, other than Labrusca and Reparia; although the Delaware is supposed to be a cross between Labrusca and Unifery. The Delaware has a poor leaf for the prairie States, but can be grown quite successfully in some locations in the Northwest by fertilizing and giving good cultivation, with winter protection.

The cultivation of this delicious fruit is too much neglected in the Northwest. I hope soon to see a new era in grape growing on the great prairies of the Northwest, and the best way for us to help bring that about is to quit buying such varieties as are usually grown East in hot houses from single buds, and forced to grow five or six feet in the space of two months, the Prentiss, August Giant and a host of that class of grapes, too numerous to mention. We should recommend and plant largely of Worden, Lady, Cottage, Moore's Early and Janesville—and plant for trial the Empire State. This is in my judgment the most promising new white grape before the public; it is a seedling of Hartford Prolific, fertilized with Clinton; thus you can readily see that it is a representative of both these valuable families of the grape; it is a vigorous grower with broad thick leaves very much like that of the Clinton; while the wood resembles the wood of the Hartford, it is early. I have seen it when about as early as Moore's Early, and the fruit is of high quality. I have great faith in grapes from this source. The Niagara grape, I am free to confess, is a surprise in many of the Eastern States, but I am afraid those that plant largely of it in the west will be surprised in the opposite direction from those of Western New York. I recommend pruning, and laying down vines in the fall as soon as the wood is thoroughly matured. The Delaware can be improved by grafting it to such roots as Concord and Ive's Seedling. I grafted last spring 75,000 Delaware cuts on Ive's Seedling roots with a good degree of success. The process is like that of the apple root grafts. I cut the Ives root in sections two inches long, and splice graft. The Delaware, cut seven or eight inches long and lap with a waxed thread same as with the apple root graft.

DISCUSSION.

Mr. Smith. To those not acquainted with Mr. Wilson, I would say that he has probably been as successful a grape grower as anybody in the country. He is president of the Iowa State Horticultural Society, and he has made a grand success of grape culture down there in Iowa.

Mr. Harris. I like the list he has recommended very well. It is probably just such a list as can be safely planted by most of the people in the West. We discarded the Janesville, I think, at our last meeting; but I thought at the time, and still think, that we ought to give the Janesville a prominent place in the list of grapes for common cultivation by farmers. It is sure to produce a good

crop where some of these other grapes that are later will not do anything; for instance, the Niagara grape, which is recommended by eastern men, we know nothing about it, and from what I have heard I have a very poor opinion of it. Both bunch and berry I am told are small, although the pictures we see of it are very fine. I understand the color recommends it. I have only tried it once or twice. It may be a fine grape for the East.

Mr. Tuttle. Mr. President, I don't see any particular use in recommending the Janesville. I consider Moore's Early a better grape. I have a Moore's Early vine, standing in the open air, which came out better than the Concord. It is hardier than the Concord, or the Janesville, and I got fully as good a crop as from the Concord. It ripens its fruit more evenly than the Concord, and is about twenty days earlier with me. I consider it the most promising grape to plant in any portion of the country where we have short seasons, where the Concord fails to ripen; I consider it the most promising grape of any that I know of. In quality and hardiness I have set it down as unexcelled by any other variety. Most of these new grapes that we saw advertised a few years ago at \$2, or \$3 a vine, can be bought now for ten cents apiece. Some have grown higher, showing that they have real merit in them. Moore's Early is pretty well known now, and will be known still more generally. I touch new grapes very lightly. I spent \$500 on new varieties that were very highly recommended. I would have done better if I had thrown the money in the fire. Since that I fight shy of them. I have full faith in the Worden and Moore's Early.

Mr. Pearce. Mr. Wilson has struck a very important point in regard to eastern grown vines and those of the West. I am, in a business way, personally acquainted with Mr. Wilson; have been for a number of years, and I must say that his vines give the best satisfaction of any I have ever handled. They are all grown out doors, and prove more hardy and more prolific than the eastern vines. I have tried the eastern vines, and got very poor satisfaction. Although you may have to pay less for eastern vines, I say be very careful when you say they are cheap. A few cents on the vine is nothing as between poor and hardy vines. Now, in regard to the Niagaras, I hardly know what to say. But, when I see so many hundreds of acres of that vine planted and so many hundreds of men getting the amounts that they do from the vines, and the price

per pound they get in all the markets, and then find other men condemning them, I hardly know where to place them. I would say this, however, that it is one of the most remarkable growers that we have. I have seen vines attain a growth of fourteen feet in one season. We had them on exhibition at our fair, some of those grapes from Lockport, New York. With the exception of two or three that were not quite ripe, they were pronounced first class; they were very large grapes, large bunches, and would be pronounced, I would say, excellent. I have been planting a few of them, and so far I am very well pleased with them. My vines are three years old; I have got them well shaped. I have also the Empire State. I am very favorably impressed with that variety. In the first place, it comes with the highest possible recommendations. The best authorities pronounce it not only an excellent grape, but free from all disease, coming from pure parents; and so far as my observation goes, I think the Empire State will probably be a success.

Mr. Smith. Mr. Latham, you have raised the Lady grape; what do you think of it

Mr. Latham. It is a very good grape; it is very early. I would recommend it planted with others.

Mr. Stubbs. Mr. President, I have had a little experience with the Lady grape. I live on Lake Minnetonka. So far as I have observed, it is not very thrifty on sandy soil, I have noticed on clay soil it did better, yet it seemed to be a partial failure. The vine seems to be hardy enough; I must say it is extremely rugged, and perhaps as sweet a grape as I ever tasted. Some seasons I have taken fruit from it by the 20th of August, although generally with me it is ripe about the 25th of August. I think the Empire State has more merit than any of the new varieties, and is one that we should not overlook from the fact that it belongs to the *Labrusca* variety which is allied to the white grape. It is as strong in its powers of resistance to disease as our wild grapes. There is no question but what disease has already made its appearance among our favorites, and it is going to be a hard matter to protect them, as it was in the eastern states. In looking for new grapes, the first thing to look for is a healthy, hardy stock. I planted a number of vines of the Empire State last spring, and they did remarkably well. The grapes ripened as well as any I had in my vineyard. Take it all in all, it seems to me from its parentage, it is one of the most valuable new grapes that has ever been brought out.

Mr. Gould. These new grapes are being offered for sale with high recommendations and people are buying more or less of them, and so I think it proper to discuss the merits of them as far as we know them. What I rose to say in particular was this, that there seems to be a craze for new and high priced fruits. That is all right, to keep things moving; something will come out of it, but I advise everybody that hasn't any money to throw away, to go a little slow. They come well recommended; they always do, if there is a good price. Now, I have been very cautious about expending money on new things; I tried it a little years ago, and I learned a lesson that has stuck by me so far. And notwithstanding this new grape, the Empire State, comes with such high recommendations, (and I believe it stands the best show of anything at present) still I am not convinced that it is all right. I think it is well enough to discuss these things, as I said before, because people are buying them. There has been quite a large quantity of the Niagara grape sold at very large prices. Well, my impressions on first seeing that grape, were that it was a success. I saw some of them last winter in solution, pickled, and I noticed that part of them were hung on the cluster, and part of them were in the jar. That aroused the suspicion that they had dropped from the bunch, and I have made some inquiries, and I have been told that they had that failing. That is a very great fault.

Mr. Latham. I had an opportunity to try the Niagara grape several times this fall. Some of them I tasted were passable; many of them were distasteful according to my idea. If these samples of the Niagara were the best that could be produced, I am not favorably impressed with it. I think it must be two or three weeks later than the Concord. At the time these were picked they were in the condition when the pulp parted readily from the skin, but at the same time they were unripe. I have never had a chance to test them when fully ripe.

Mr. Smith. I would like to inquire whether it is not considered later than the Concord.

Mr. Latham. Those were gathered at the same time as the Concord I should judge; they were shipping them at the same time that Concords were selling. But they certainly must be ten days later.

Mr. Smith. In correspondence with parties in the East who are not growing them or selling them, but living where they have had good opportunities for judging, they have written me that it was

fully a week later than the Concord on the same ground. Now, if that is a fact (I don't say that it is, but that is what I have been informed,) I think it puts it out of our reach, as Mr. Gould says, entirely.

Mr. Harris. If anyone wishes to plant the Niagara, they can get a circular by sending to Mr. Hubbard, of the Niagara Grape Co. He will send vines for sixty cents a piece if you take more than ten. It is well to get one of those circulars.

Mr. Pearce. Are you correct about getting as few as ten at sixty cents apiece?

Mr. Harris. Yes, sir, I can get a single vine for sixty cents, and so can you.

Mr. Pearce. I think there is an error somewhere. I had a letter from Mr. Hubbard stating that his wholesale price was sixty cents; he gives those that buy the privilege of selling at sixty cents, or for just what they please, provided they don't sell for less than sixty cents, but you must take fifty or a hundred vines.

Mr. Harris. No, I think you can get any quantity; they don't ask for any contract, only they will not sell them for less than sixty cents apiece.

Mr. Sias. I have been urged to take the agency of the Niagara grape, but I have always refused for two reasons: first, because they are too late in ripening, and second, they are too high in price.

Mr. Tuttle. I think, so far as the Niagara is concerned, it is generally condemned in the West. It is considered a very valuable grape in New York and Ohio. Mr. Hubbard sent me some specimens with the request that I would give it notice; I have refused to do it. I think we have superior grapes, and if we get something out of these new kinds that will prove valuable, I shall be glad of it.

Mr. Bost. The Janesville isn't a vine that we ought to cultivate, on account of the poor quality of the fruit. From what I have observed of those planted in my neighborhood, I don't think we should encourage the propagation of it.

Mr. Harris. It is not a very good grape for eating, but is for cooking purposes very early, and I think most people would prefer it for cooking to all others. I think it is quite desirable, where you are planting vines for your own use, to have a few of the Janesville. It is better for jellies and some other purposes than the sweeter varieties.

Mr. Barrett. I don't rise to engage in a discussion of this matter, but I hope that this body will define itself clearly on this subject. Perhaps you may not be aware of the fact that this organization has a

great influence among the rural people. I noticed last year they sought the daily papers, to get the reports that appeared of our meetings, with reference to this and that, and whatever this Society recommended the people were desirous of procuring. We are troubled in our region with irresponsible agents who go through the country and see the farmers, recommending this and that, and the farmers are looking to this Society to get its recommendation of what is best. I hope therefore, that it will define itself clearly as to certain varieties. I am much interested in horticulture, although but a beginner. I just started a nursery in the vicinity of Traverse. My grounds are in Dakota, but I live at Brown's Valley. I came here as a voluntary delegate to learn all that is possible, and my friends defer to me, in a measure, with reference to the news of your meeting that I am to bring to them.

There is one thing that pleases me, and that is the tendency to conservatism of this Society in recommending new and untried varieties of fruit. I make this suggestion that the Society define itself positively in this matter, for the benefit of the rural class, that they may understand what to do.

President Smith. That matter will be more fully reported upon by the special committees.

On motion of Mr. Elliot the President then proceeded to read his annual address, which was received with applause, and on motion referred to a committee of three, appointed by the Society, consisting of Messrs. Wyman Elliot, J. S. Harris, and A. W. Sias, to report upon the same.

PRESIDENT'S ANNUAL ADDRESS.

Members of the Minnesota State Horticultural Society, Ladies and Gentlemen:

It gives me much pleasure to meet you again. And my sincere desire is that you may each and all have a pleasant and profitable session, and that each one upon returning to their respective homes will feel that they have been amply repaid for time and expenses in attending this meeting. I will not consume much of your valuable time, knowing full well the addresses and discussions to follow will be much more interesting and instructive than anything I shall have to say.

But I must ask your indulgence while I offer a few suggestions, which I do in hopes they will bring out others that will add to our usefulness as a Society and to the ultimate benefit of horticulture in our entire State. And in so doing, I do not insist upon the adoption of any one of them, but hope that you in your wisdom and better judgment will adopt and carry out only those views or ideas that bring the greatest good to the greatest number.

First, our finances need and require your careful attention, and should receive it

early in the session so that we can have ample time to attend to the matter. As most of you are aware, the decision of the attorney general in regard to our reserve fund and the setting aside of money to meet the premiums offered by the executive committee of this Society, in accordance with resolutions and instructions of this Society, and as printed in our Report for A. D. 1884, pages 256 and 257, and which all thought were in strict compliance with the law meeting our appropriation. But the attorney general differed with us in regard to our rights under the law, consequently we must bow to the power in authority. But thanks to the kindness and courtesy of state auditor Braden, after the matter was fully explained to him, I think has so arranged matters that we can easily work our way out without further difficulty. The auditor informs me there is now standing to the credit of the Minnesota State Horticultural Society the sum of one hundred dollars on appropriation for 1885, and one thousand dollars on appropriation for 1886, and available when needed to pay premiums and necessary expenses of the Society. But, as I understand them, we must in order to draw this amount first use up our reserve fund drawn from the State, and now in hands of our treasurer. And in order to do this, it will require some action by this Society to authorize the executive committee to so expend this fund. Then as I understand the matter, instead of having our reserve fund drawing interest in the hands of our treasurer, we will be obliged to keep the amount on hand in the office of State Treasurer without interest, the auditor having consented to carry the amount over to our credit instead of carrying it back into the treasury as unexpended balance, as is customary in such cases, and in that case we would only lose the interest now received on our reserve fund. I believe the affairs and finances of our Society have been prudently and as economically managed in the past year, as the welfare of the Society would permit.

Our last legislature failing to pass the appropriation to enable us to make a display and be represented officially at the last meeting of the American Pomological Society, held at Grand Rapids, Michigan, in September last, left us without representation in that honorable and useful body, with the exception of Hon. Peter M. Gideon, of the State Experimental Farm at Minnetonka, who, I understand, attended and from whom I hope to hear a report of their proceedings; and I hope at the next meeting of said society that we may be able to make a general display and gain some fine prizes for Minnesota and our Society. I would recommend the election, at this meeting of a legislative committee of five of our best and most influential members to attend to such legislation as may come up in our next legislature for the benefit of this Society, among which should be the provision for a State Entomologist and the erection at State fair grounds of suitable buildings for the purposes of exhibition of all horticultural products. Now if the State Board of Agriculture wishes and expects the Minnesota State Horticultural Society and its members to take an active part and help to make the State Fair the success it should and could be made, inasmuch as they receive all the gate money and State appropriation for premiums, they should be requested to and should set apart for the use and benefit of our Society, to be under the entire and exclusive control of the executive committee of this Society, a sufficient sum to enable them to offer liberal premiums on all horticultural products, and they should have them and the making of premium lists and awarding of premiums thereon under their exclusive charge; and such

premium lists should be made out in time to be printed in our reports as early in the season as possible, so that all could see what premiums they could compete for. I think the executive committee, composed of horticulturists, would be more capable of getting up a premium list suited to our wants, and one that would bring out a larger and better exhibit for the same amount of money, than by the course now adopted by the Board of Agriculture, and one that would give much better satisfaction to all concerned. In order to make our exhibits and Society a success, the premiums should be offered principally on single plates of fruit and single specimens of plants, or for best three or six plants of a kind, for best peck, one-half peck or dozen or one-half dozen of vegetables, and first, second, third and fourth premiums offered on all leading desirable varieties, and then a reasonable amount on a few sweepstake premiums. In offering on single plates and specimens instead of largest display, you will give all an equal chance to compete for all premiums, and in that way I think, bring out the choicest specimens from all our growers, and get up a display of real merit and worthy of the premiums offered. When the premiums are for best or largest display there is only a few of the largest growers, or those who can obtain from others what they lack to make up an assortment, that will exhibit at all, and is it not much better to have one thousand exhibitors with one or two specimens of choice fruit or plants, than to have only two or three exhibitors with a large display, many of which are only put in to make out a collection of a large number of varieties, and are worthless to grow for any other purpose.

I would also recommend a list of premiums for young ladies and gentlemen under eighteen years of age, or men that age, to induce them to make exhibits and become interested and active members of our Society. Again, instead of offering agricultural papers for all second, third and fourth premiums, amounting to one dollar or less, I would offer one year's membership to our Society and a copy of our reports. Hoping thereby to introduce them into every school district in our entire State.

Believing, as I do, that the Minnesota State Horticultural Society was organized for the benefit of the people of the State of Minnesota, and not for private purposes of any kind, whether in the interest of nurserymen, old settlers, or a mutual admiration society. You will pardon me I hope for the views herein advanced. When I look around and see the same old faces for so many years, and see them slowly passing away to other, and I hope better fields of labor, and their places supplied only by others of about the same age, I don't wonder at the question being asked, if ours is not an old settlers association? Then, again, when I hear discussed by the hour the Duchess, Wealthy, or Transcendent crab year after year. that someone should ask if some nurseryman has not an ax to grind, or are we not talking to see which can make the best speech, or for mutual admiration.

I for one feel that there are other vital and important interests in horticulture, floriculture and arboriculture that demand, and should receive, at least, a share of your attention. The cultivation of vegetables and the varieties suited to our soil and climate has been almost wholly ignored by this Society, while there are more than twenty engaged in growing vegetables and small fruits, where there is one in growing apples to any extent; and there is received and marketed in this State, at least, fifty dollars worth of vegetables and small fruits where there is one dollar's worth of apples; and still our State has this season imported many thousands of

dollars worth of vegetables, to say nothing of small fruits that could and should have been raised in our State, and the money saved to our own citizens, instead of going to other States. One town in Michigan boasts of having shipped 20,000 tons of celery, much of which has found a market in St. Paul and Minneapolis and other Minnesota towns, and this, together with car loads after car loads of other vegetables have come to Minnesota for a market that could have been grown here of better quality, and at a large profit. Now, would it not be well to get the vegetable gardeners to come in and take an interest in our Society and discuss the best varieties, mode and manner of cultivation. Again, if we would get the ladies to take a part and interest themselves in our Society, (and who is there that does not want them here) should we not take more time for discussion of different house plants, flowers and shrubbery, and the best varieties and mode of cultivating them?

Now, in regard to our Summer Meeting, instead of having a two days' meeting and exhibition, I will propose that the Society form itself into a committee of the whole and pay a visit to the State University Experimental Farm, and there take our baskets of lunch and spend the day, some time in the month of June agreed upon by the executive committee and Prof. Porter, and in this way learn more in one day than we could discussing here for a month, and all take notes of what he or she sees new or of interest, and then when we come to compare ideas at our winter meeting will have something for a common standpoint, from which to judge of different varieties and modes of cultivation, and a chance to see and learn more of new and improved varieties and modes of cultivation than in any other way, and at the same time see and know what is going on here in our midst for our special benefit.

I have thrown out these suggestions, but wish it distinctly understood that I do not insist upon the adoption of even one of them, but offer them in the hope that they may suggest to the minds of the members of this Society the importance of adopting some measures to interest and draw into our Society the young and rising generation, so that they may become active and honorable members thereof. And that the Minnesota State Horticultural Society in its usefulness may survive long after its present members have gone to their last resting place. And that we may have done something in our day to put the Society in a prosperous and progressive position, will ever be the wish and prayer of your humble servant. Thanking you each and all for the kindness and good feeling shown me, I herewith return my thanks for the honors conferred upon me, and will bespeak for my successor your best aid in carrying on the good work already begun, and may it go on without interruption until every town in this State shall have its orchard, fruit, vegetable and flower gardens, and its yards filled with evergreens and shrubbery, and its sides fenced with shade and ornamental trees, and each school house in our State its play grounds well laid out and beautifully supplied with shade and ornamental trees, shrubs and flowers and the requirements of horticulture and plant growth taught in every school in our land. To this end let us each and all work with a will and harmoniously, and that each individual member will forget and forgive each and all their differences of interest and opinion that naturally and frequently occur in Societies of this kind, and always remember, to freely accord to others the honesty and freedom of opinion that they expect to exact for themselves.

The next on the program was the following paper:

CROSS-BREEDING OF PLANTS.

By GEO. P. PEFFER, Pewaukee, Wis.

Plant breeding has reference to crossing, or producing new varieties from seed, or originating new varieties of any species from flowering plants, or tree-fruits of any kind. New varieties are constantly and naturally produced by pollenizing our domestic fruits. This result may be secured when several sorts of the same species are in bloom at the same time.

We cannot depend upon seeds saved promiscuously to propagate a certain variety and obtain the same result secured by grafting. But if we understood how to control a variety, or species, and the proper manner of assisting nature by hand work, (if only on a limited scale) we may produce a better fruit in respect to quality, size, color or keeping merits, or all of these characteristics combined; also, at the same time promote hardiness and productiveness.

It is necessary to understand the characteristics of fruit blossoms in order to distinguish between those which are stamen and those which are pistil varieties. Both forms are found usually in the same flower, especially on fruit trees. It is necessary to cut out the stamens from the flower to be used for the female plant before the large leaves spread open. The flower should then be confined within a paper bag, or other proper covering, until other flowers, having stamens, and which have not been disturbed, are ready to burst into full bloom, when one of these should be placed in the bag, leaving but two flowers in the same bag.

If it is desired that the new variety to be obtained shall combine hardiness and thriftiness of tree, the female (or the flower from which the stamens have been removed), must be the hardier of the two trees from which the flowers are taken. If good shape or form of fruit is desired (the color will not differ greatly), the one used for the male must be taken from a tree having the qualities desired; the same may be said as to season of ripening, quality of fruit, flavor and productiveness.

As soon as the air is warm enough to open the petals, or flower leaves, the pollenizing is accomplished. By labeling the limb or spur by the name of the staminate or male variety used, there will be no room for mistake in keeping the proper record of the experiments made.

By saving seeds from fruits pollenized in the manner described and planting them, the product when fruiting will not vary materially from the two varieties used to originate the new variety.

In order to perpetuate a variety which is sometimes desirable, in order to secure hardiness of tree and preserve the identity of the species, isolation is necessary in order that the pollen from other flowers may not supply the pistils. As soon as the flowers are ready to open, in order to keep them fresh until the pollen around them is scattered, enclose a few bunches in a paper bag, allowing them to open within the bag. Keep them confined until the flowers are fully developed before removing the covering. In this way the variety may be perpetuated by preserving the seed from trees treated in the manner indicated.

Had this system of perpetuating hardy varieties been extensively practiced since these Northwestern states were first settled, and varieties propagated from, which

had proven specially hardy in certain localities, we would not now be required to send to Russia to obtain hardy varieties. And it is my opinion that we will have to resort to this practice yet if we want to raise fruit of good quality.

Much credit is due to Prof. J. L. Budd for his efforts in introducing the new Russian varieties of the different fruits; for the accounts of his visits to the fruit growing districts of Northern Europe, (in company with my friend from Canada, Mr. Chas. Gibb); for his description of the varieties of fruits found, the character of the climate, the distances between certain varieties, where found, etc. From the descriptions he has given I take it for granted that the countries visited were older than ours. From these investigations and from personal examination of the Russian varieties with which I am familiar, that have been propagated here, I conclude that *all* of these more valuable Russian varieties were produced from seeds; that the best varieties are from natural crosses; that the progress made thus far is due in part to gradual acclimation, and advancement to more northern districts.

It should be observed that very few varieties of special value were found in large districts of country; that the farther north we go the fewer are the varieties found having any merit. It is true Prof. Budd refers to latitudes and situations much colder than ours. Many of the varieties found in such localities will no doubt prove to be hardy enough in our climate. In fact many sorts have already proven to be so, since they came through all right the last test winter.

We have personally tested some thirty-nine varieties of Russians which were fruited in Wisconsin, also made outlines of some of the best, noted the time when ripe, quality, etc., etc.; but we failed, however, to find a single variety in the list that was equal in quality to the Wealthy, except, perhaps, the Longfield. It may be as good an apple but is not as long a keeper, and in my estimation is no hardier, grown side by side with the Wealthy, as I have seen both varieties badly damaged.

There is no doubt that many of the new Russian varieties will prove a blessing where other varieties can not be grown successfully, or where nothing but the Siberian crabs can be grown. But there is a limit to all things, and many who are trying to grow these varieties will be disappointed.

Prof. Budd undertakes to predict that wherever melons and Indian corn can be grown successfully, becoming fully ripe, either east or west, that most of the hardier Russian varieties can be grown; not only of the apple, but also of the pear, cherry and plum. In his estimation they are all the time improving, especially those varieties which originated in that part of the country where dent corn and melons have ripened. I am in hopes the Professor is right; it certainly would save much time. But if he is not, then the surest and best way to proceed would be by the production of new seedling varieties.

It has been demonstrated very conclusively to my mind that nearly all the Russian varieties are crosses originated in localities where varieties have been kept separate by local causes, which is, no doubt, the occasion of the distinctions which exist between many of these varieties. It also appears that all the improvements made have been from natural pollenization and by reproduction from the seed.

It has required the process of many years of continuous cultivation and propagation to produce such fruits as they now possess and enjoy. The Russian people

deem them to be excellent varieties; so also would we if we had never tasted anything better.

By means of cross-breeding we can improve even the best known varieties of our fruits. To accomplish this result it is only necessary to use our best sorts for the male parent.*

DISCUSSION.

Mr. Smith. Mr. Pepper takes the ground that the quality of Russian fruits is of a much lower standard than of our best American seedlings, and that while we may perhaps gain something by the general production and planting of Russian fruits, the apples of the future for the Northwest must be produced from American seedlings, and not from the propagation of these Russian varieties.

Mr. Harris. I would like to hear from Mr. Sias on that question.

Mr. Sias. My opinion is that we have no better fruits and better quality of apples in the State than we find among those same Russian varieties. You may take, for instance, the White Transparent; I don't know whether I have ever fruited anything that surpasses that in quality; the Russian Green is hard to beat. I have several other varieties of very fine quality. I have not seen any native seedling varieties that surpass them; there may be some in the Northwest somewhere, but if so, I have not seen them.

Mr. Tuttle. It is a little singular that Mr. Pepper should take that position at this late day. There was a time when that was the general cry. I don't know where, and I would like to be informed where the American seedlings are that have been originated in the Northwest that would compare in quality with those of the Russians. We have to fill the place of all those old varieties that we have heretofore been depending upon. And we have Russian apples to fill their place, as market apples, as to quality and as to productiveness. I defy any man to take the same number of American seedlings and compare with the Russians in these respects. If anything, I should say that the Russian apples are the better apples; they are better in quality. We have a large number of those apples of different qualities; for instance, there is the White Transparent, an early apple. That has been fruited more generally and is better known, both east and west, and it stands to-day ahead of any early apple grown east or west. I would like Mr. Pepper to mention an apple that would compare with

*Mr. Pepper states in a private note that he has only briefly referred to cross-fertilization in this paper, since the process is more minutely described in some of the earlier volumes of the transactions of the Society.—SECRETARY.

the Transparent. It is equal to the Early Harvest; it is larger, finer, and always perfect in form and handsomer in appearance, and is considered by eastern consumers as being ahead of any apple in the east. Consumers in New Jersey place it ahead of any apple in the east. Then coming after the Transparent we have other apples, which take the place of the Early Joe and Strawberry apple; the Green Streaked apple, a large apple of the Alexander type and better in quality. I might go through the whole list. There is the White Russet; that will take the place of our old variety. It is an apple that for bearing and beauty, and in the market will fully take the place of the other. I can go through the list, and mention apples which will take the place of those that have failed. It is too late in the day for a man to come out and talk about there being no Russian apples of good quality, or that there are no Russian apples that will keep. We always considered Mr. Pepper's opinion as of a good deal of value, and I am a little surprised that he should take that stand. I have exhibited to Mr. Pepper some of my Russian apples, knowing that he had been opposed to the Russians; I wanted him to see and examine for himself. He made that examination and expressed himself as believing that the Russian apples were the apples of the future.

I trust I have no interest in this matter, beyond the interest of this great Northwest; of course we are growing them. I have been to work at those apples for the last fifteen or twenty years. I have believed (after I heard what there was in Russia, 500 miles beyond Moscow, in a climate more rigorous than Dakota, where they have the most extensive orchards in the world) that from there was to come our fruits for the whole Northwest. We have for forty years been trying to propagate seedlings, and what have we got. We haven't produced a seedling that will compare with the Duchess of Oldenburg. And we may go on, and we will go on for years, and after going on for 500 years, I doubt if we will get where Russia stands now. They have a class of fruit such as we cannot grow of American varieties; they have the apple, the pear and the cherry. And I have no doubt that when we have introduced their hardy fruits, that Minnesota will become as good an apple growing State as Michigan or Ohio.

Mr. Sias. In regard to the Transparents. I came to Minnesota from Western New York. I believe that is considered a good fruit growing country. I think the Early Harvest was considered one of best early varieties they had. And yet they are very much surpassed by some four or five varieties of these so-called Transparents. I can-

not see why they are not equal to any of our American apples. I agree fully with Mr. Tuttle in that respect. I know of nothing better. I think they are sufficiently hardy for my location. I have fruited the Red Transparents and the Green. I have never fruited the Yellow which he has spoken of particularly, but it is cultivated in other places and I have seen them. I know it is one of the best. But there isn't very much difference between that and several other members of the family. The earliest apple that I have raised is the Early Champion. It is a very fine apple too. It is not quite as good in quality as the Red and Green Transparents.

Mr. Smith. Peffer says that he tested thirty-nine varieties of Russian apples as to length of time in ripening, quality, hardness, etc.; none came up to the Wealthy except the Longfield.

Mr. Tuttle. I think Mr. Peffer is mistaken. The Wealthy is the only American apple that we are propagating. We have found among the Russians varieties that are hardier. The Longfield is hardier than the Wealthy. I had a tree that bore an enormous crop a year ago last fall; I am confident if it had been a Wealthy tree it would have been dead in the spring, but that tree is now in good fair condition.

Mr. Cutler. I have understood that the Yellow Transparent was not a safe tree to plant beyond a certain limit. I would like to inquire if any of our nurserymen living in this vicinity have tried it?

Mr. Pearce. Mr. President, permit me to say a few words on this subject. They seem to be a little hard on our friend Peffer. A few years ago Thomas Moulton, introduced a good many of the Russian trees of many of the varieties prominently known, such as the Transparent; there were, I believe, thousands of those trees sold in this vicinity. Gentlemen, I will give you \$5 for every one of those trees that you can find alive to-day. They grew and bore fruit, but there is not one of those trees he sold here but what is dead. It has proved that they don't begin with the Wealthy in this section of the country. We have tried them twelve or fourteen years ago. Now, there is the Transparent, probably it is as hardy as any; it appears to be hardy. But the fact is, these trees are not where they belong; they belong further north than here—entirely so. These trees live through the winter, the warm weather comes on, the buds appear, and after that they die. It is not because they are not hardy; they are as hardy as any tree, but it is something else. They are out of their latitude; they belong further north. You put them on high hills and knolls and they do reasonably well. Take the Transparents every last

one of them—large trees that were eight or nine years old—have died. Now, this is a fact that is well known among fruit men in this section of country.

Mr. Tuttle. Were those Transparents that died?

Mr. Pearce. No, but they have failed.

Mr. Sias. I have not had very much experience with the Yellow Transparent. I have some of the White which I set out a year ago last fall; the White seems to be very nearly the same thing as the Yellow. They are all alive to-day. Of course, that isn't time enough to test it. But last winter we considered the hardest winter we have seen since we have been in the country, and we must conclude that they are tolerably hardy; right opposite them we had the Wealthy, and nearly all of them were killed.

Mr. Pearce. Mr. Sias has high ground, and very well adapted for those Russian trees. Now, you can take certain localities for the Transparent and it is all right, but you must select a locality that is not subject to those sudden changes that do the damage.

Mr. Tuttle. I would say that I don't consider the Transparent as hardy as a good many other kinds, but it has stood a good deal better with me than the Wealthy, and it is hardy enough, I think, for our State. And so far as my orchard trees were concerned or nursery trees I never saw anything that showed tenderness. I had several hundred Russian trees in the nursery, and several hundred in the orchard last winter, and every one came through in good condition. I have had no reason to doubt their perfect hardiness. I have not the least doubt but that they will compare with anything we have been in the habit of growing, take them as a class.

Mr. Latham. I visited the orchard of Mr. Gould a year ago last summer; I found quite a number of trees broken down more or less, and on those there was scarcely any fruit. I asked Mr. Gould what was the cause of that; he said those were nice apples and the boys came out there from the city and broke down the trees in getting the apples. I judged they were not in the best condition to show the merits of fruit. The varieties of the Russian that I have seen, on my own place and elsewhere, have done well, and some that I have are hardier than the Wealthy. I will not say as much for their quality. I examined an orchard with Mr. Gould when Early Harvest apples were ripe, and we made a thorough search through that orchard; we didn't just run through it. I think we went to every tree. The man that lived on the place went with us, and I think he took us to

every tree that had been grafted or borne apples of a Russian variety, and quite a number of those trees were in bearing, and some of them had been broken down or limbs broken off, I think on the Transparents mostly. Some of the limbs were quite large when they were grafted, and they broke off easily. We found quite a number of them in bearing but the most of them were poor in quality. We found one or more that were nice, smooth apples, of fine flavor, and one tree that the man pointed out that had been bearing, he couldn't remember the name, but those he said the boys had destroyed. I think there was only one branch left, and we could see where the others were broken down.

Mr. Stubbs. I am quite interested in this subject of Russian fruits. I would like to know if there is a history of the pomology of Russia, that is of how they started their fruits in that cold country. Did they have to battle with the elements, or import their stock from Asia? I claim, if they could fight the elements of nature for a hundred years and produce such wonderful fruit, as has been admitted they do, where it is certainly colder than it is here, I see no reason why we should be discouraged because we have not achieved full success in thirty or forty years. Perhaps they worked for one hundred years. I believe, gentlemen, that our fruits which we will get here in the future will come from our seedlings, and I still sincerely hope that these seedlings will abundantly repay those gentleman who have worked so assiduously and untiringly in the propagation of American seedlings. I would like to know the history of fruits in Russia, how they brought them up to the standard of their present excellence.

Mr. Somerville. Mr. President, I have been trying to raise a few Russian apples for a number of years. I got trees of Mr. Sias of Rochester. I set them out, and I will say that I have had more fruit from those trees than I have ever had from all the seedlings from that time to the present, and I have tried almost everything that I supposed was hardy. I think it would be useless for us to wait at this time to raise seedlings when we have got Russian varieties that are adapted to our soil and climate. I set out an orchard some fourteen years ago of about eight hundred trees. I selected the best seedlings to be found in the country, the best that I could hear of, the Wealthy along with the rest. I also now have about forty-seven Russian varieties. I am not a nurseryman, and will not undertake to tell the names of those Russian varieties. Last winter killed pretty near the last of the trees in my orchard, except my Russians. Of them I think I haven't one that

was injured. I think I have something over twenty varieties in bearing, and there are some there that are excellent fruit, and there are others of them again that are far from being valuable. The majority of them I consider good keeping and good cooking apples. I think the only way we can succeed at fruit raising is to get these Russian varieties and make selections, and thus take advantage of their five-hundred years' experience, and by doing that we will get our fruit right away, at the start. That is my opinion. Now, of my Wealthy, which we consider stands at the head of our seedlings, everything was killed or injured. And so I think we can get the fruit quicker through the Russian varieties than we can in our own seedling system.

Mr. Sias. I am aware, as Mr. Peffer says, that the Russians have the reputation of being poor in quality, and it just occurred to me what the reason might be. There is always a reason of course, for everything. Among the earlier varieties sent me out of the Moulton orchard was a Russian. Those apples commenced bearing very early, and there has probably been more of those raised in this State than in all the rest together, perhaps. They are of a very poor quality of fruit, they are coarse grained, bitter fruit, and I can't think of any better reason than that for the reputation that Russian apples have got for quality.

Mr. Harris. When our pioneers came to Minnesota, they first had to content themselves with a hole in a clay bank or a log cabin, but afterwards they came to live in palaces, and we now experience none of the hardships of the early settlers. And so, it would be unwise in us to neglect such a great boon that is coming to us in the Russian fruits. We are told that they were more than five hundred years in getting the apple up from China before they would produce fruit in Russia. I believe that our seedlings can be brought up I believe that replanting and continued replanting will produce that hardiness which the Russian apples have attained at home, and bring them up to the standard which we desire to reach; if we understood the physiology of vegetables and fruits, perfectly, that we could raise our own seedlings to the standard that the Russians have in theirs. I don't expect that these Russians that are being brought here, or any large portion of them, will prove what the American taste will demand. I have no doubt that the majority of them will prove hardy and thrifty, when they are planted in the right place. There are some varieties that may stand upon the most arid and cold points; there are probably other varieties that would not stand that rigorous treatment, but

would come to perfection in the valleys and prove to be our choicest apples; and there are others the taste of which is so bitter that we couldn't hardly get our pigs to eat them. Perhaps those will grow upon the most arid of our hills. It would be useless to raise great quantities of these Russian apples that are almost worthless, but I have a good opinion of some of them. I believe we ought to avail ourselves of these Russian fruits, but ought to move a little slow, and when we purchase, instead of buying at Rochester, N. Y., and from Ohio nurseries claiming to have the new varieties, that we should try to get them from nurserymen that we know have them. Mr. Wilson, of Iowa, has some; Mr. Gibb brought some into Canada. We know Mr. Tuttle has them. But we don't know that we get a "Siberian crab" from the nurseries of southern Illinois and Ohio. Their agents are bringing up to Minnesota trees that they tell us are "new Russians," "the best thing ever was," and are selling them at a dollar apiece, when they probably bought them at home for ten cents apiece. I hope the farmers will try and get some of the very best of these Russians, and that they will, when they have planted them and grown fruit, raise seedlings from these, and from these seedlings take the best and raise seedlings again, and if we continue doing that we will turn the Russians into full-blooded Minnesotians. We will adopt their fruits as we have their citizens, (for there is none of us but what have come from a foreign race) and in that way I am confident that we shall produce the best fruit that can be grown. We have the elements in our soil and atmosphere to perfect the fruit; we will take their hardiness in the tree and we can get the American flavor into it in time.

Mr. Tuttle. I wish to say just a single word. It seems that there is a sort of a universal sentiment, but a wrong one, that the Russian apples are all poor. I can mention varieties among them that will rank with our best American apples. Take the Anisettes, the Fameuse, the Golden White and others; they are good in quality. I never expected at first that we could get half a dozen, or as many as ten varieties that would fill the bill, but we have got them. I don't claim that all these Russian apples are of first quality, but I do claim, that take them together, they are of good quality.

The following paper was then read:

THE "BLEEDING" OF APPLE TREES.

By T. H. HOSKINS, M. D., Newport, Vt.

A recent writer says he has trimmed apple trees every month in the year, and has come to the conclusion that from May 25th to June 25th is the best time, because a wound made in the full flow of the sap will begin to heal immediately. He adds that March and April are the two poorest months to prune, because there will be a liquid "forming" (query, flowing?) out of the wound, which will kill the bark underneath the limb. Another writer insists that March is the best of all months to prune, because the sap is not then in motion, and the wound will dry before the sap starts, and that then the process of healing will go on most favorably, while anything but very light pruning in June will greatly weaken and sometimes kill the trees. Still another writer says, shortly and emphatically, "Prune when your knife is sharp," without regard to season. All these writers are orchardists of experience. Is there, then, no proper time to prune, or no way of intelligently reconciling the seemingly contradictory views of these practical men?

WHY APPLE TREES BLEED.

A widening accumulation of facts does, in all disputed questions, tend towards the reconciliation of conflicting opinions. In the thirteen years that I lived in Kentucky I never saw an apple tree "bleed," that is to say, I never saw a flow of disorganized and blackening sap from the stump of a severed limb. In the first years of my orcharding in Northern Vermont, this so called bleeding exhibited itself in nearly every case where a limb of any size was removed, no matter at what season the operation was performed. It was the most discouraging of my experiences at that time, and I could not understand it, or find a remedy for it.

About fifteen years ago, at a session of our State Board of Agriculture in the Champlain Valley, where this question of pruning and subsequent bleeding was discussed by many orchardists of that orchard country, one of the speakers dropped the casual remark that he had never known an apple tree that was not "black-hearted" to bleed, no matter at what season it was pruned. That thought was much more fruitful to me than my orchard had been up to that time, for all my trees were black-hearted, except the Siberians and Russians, which I at once remembered never bled, no matter when they were pruned. And at the same time I remembered that apple trees are never black-hearted in Kentucky.

THE CAUSE OF BLACK-HEARTEDNESS.

The state of black-heartedness in the apple tree is unquestionably the result of excessive winter's cold. In New England a large proportion of the most popular apples are grown upon trees that are more or less black hearted. The Baldwin is always black-hearted in Maine, New Hampshire and Vermont, and frequently so in the three southern New England States. Along its northern limit it can only be grown when top-grafted on some hardier stock. With me a Baldwin tree or graft has never lived long enough to bear an apple.

Now; if it be true that only black-hearted trees bleed, then the experience of orchardists must vary according to whether they are growing more tender or more hardy sorts. When I began, though I planted the hardiest known of New England

sorts, yet almost all my trees became black-hearted in a few years. Now that nearly all of that class of trees have been up-rooted from my orchard, and re-placed by the "iron-clads," I see almost no bleeding, and when I do see it I know the cause. I do grow a few sorts that suffer some in this way, (such as Fameuse,) because of the excellence of their fruit. The Fameuse is with me as hardy as the Baldwin in the upper Champlain Valley, and though the trees are short lived in both cases, they are planted because of the merits of the fruit.

WHEN TO PRUNE.

In my experience it makes no difference at what season a black-hearted tree is pruned, as regards the subsequent flow of disorganized sap, provided the limb severed is so large that the stump will not quite or nearly heal over in one season. This flow takes place during the whole growing season, and injures (often kills) the bark over which it runs. A tender tree, subject to black-heart, should be pruned very sparingly. Branches not too large to heal over in one season may be taken off, and the best time to do this is in June, as the sap is then too thick to flow freely. But heavy pruning in June is a severe shock to the tree, even to the hardiest kinds, and almost surely fatal to any tender sort. Fall and winter pruning is also injurious to tender sorts, as the bark around the wound will be killed for some distance, and there is little hope that it will ever afterwards heal. But any of the varieties that never become black-hearted may be pruned "whenever your knife is sharp," remembering this, that June pruning is a shock more or less severe, according to the amount of wood removed. "Prune in summer for fruit," is an old and correct rule, for the very reason that the shock of summer pruning (like anything that weakens the tree) tends to cause the formation of fruit buds. The effect is much like that of root pruning, and both must be practised with moderation and judgment.

DISCUSSION.

Mr. Sias. Mr. President, I fully agree with Dr. Hoskins in regard to pruning trees. I am well acquainted with his location: it is almost precisely on this latitude. He is a man thoroughly posted, and I think if we follow his directions and suggestions in regard to pruning, we will find them all right and applicable to this latitude.

Mr. Gould. He says if they are trimmed in that way only the black-hearted limbs will bleed; it seems to me that isn't just right. It seems to me that the other limbs do bleed sometimes.

Mr. Harris. I think he leaves the bars down there.

Mr. Gould. I have discovered that the trees don't bleed if pruned in the latter part of March, or first of April, before the sap starts at all. And there is another time in August,—I am speaking of the time I consider it safe—after the growth is made and the hardening process is taking place, the tree is not then growing so much in diameter. If they are pruned when this extension growth has ceased they don't bleed, and I have practised pruning at that time more or less. Where

you prune in August they will heal over that same fall. It is not safe to prune late in the fall, or just before the winter. The cold seems to penetrate at these points, and the result is that the wood will die around those wounds and the sap will begin to run through, and the insects will come in there or the worm and injure and destroy the tree.

Mr. Latham. Mr. President, I have never tried pruning until recently. I made up my mind that I would prune my nursery stock in the spring and so I went out when the top of the ground was frozen, and pruned them with a sharp knife, so as to leave no scar or spot that would not be covered with the growing bark. I made it a rule to trim my orchard at the same time, although I have found it is safe to cut a small branch at any time, if cut close to the tree. But in pruning orchard trees, it is better to prune them in the spring before the sap starts. The wood then dries over. If the wound is larger than a ten-cent piece, I have always made it a practice to cover the wound with some kind of salve, and I don't know as I have ever seen a bad place on a tree from pruning, treated in that way.

Mr. Pearce. I have observed that my graft cions sometimes rot at the end. I graft a good deal. My cions are cut in the fall; I pack them in saw-dust; I graft them in the spring of the year. I take a healthy cion, and it is sound clear to the end; I take another apparently healthy cion and find it rotten one-third of the way out, while the other is perfectly sound. Every man that has used grafts has found that to be true, and I would like to ask if anyone can tell why it is?

Mr. Gaylord. I have been experimenting some with apple trees for a great many years on a small scale, and I will tell you that our Iowa folks have come to the conclusion, the leading men all through our state have come to the conclusion, that the best time to trim trees is when the leaves begin to open, when they are as large as a ten-cent piece. We have a man down in Iowa who declared that winter was the best time to trim trees. He went out and trimmed a number when the thermometer was twenty degrees below, and one of those trees bled all summer long.

I am well convinced that a knife should be used very little in this Northwestern country. We never should graft a limb larger than my thumb, and only a little at a time. Three or four grafts are sufficient to commence with.

Mr. Sias. I am still of the opinion that the Doctor is right. If your trees are perfectly hardy, as he says, you can trim any time—any season of the year. I also have trimmed considerable in September, and I never have seen any bad results in pruning at that time.

Mr. Harris. I bought some of the trees that Mr. Sias pruned in September, and they dried up so as not to show any particular injury to them, but I like to trim when the leaf is full size, by taking the branches off that are not more than a quarter of an inch in diameter. Large branches are better taken off some other season of the year. I have done it as late as October, and I have seen no bad effects from trimming at that time. I never saw a black-hearted tree but what would bleed. About cutting the cions; I know that Mr. Pearce's experience has been that of others. I have had them rot when others would not, put up in the same box, in the same condition; they will rot a piece from the end. Why it is or what, I cannot tell.

Mr. Smith. If you cut them when they are frozen they will rot some distance; usually, I think, from one-sixteenth to half an inch.

Mr. Pearce. There are facts with reference to trees rotting or drying up that are well known to old settlers. I lived in a country where they sometimes wanted to clear ten or twelve acres of timber in a season, where we used to rot it and burn it. If they wanted to saw the timber they took a certain time in the summer to girdle and cut it. If they wanted a tree to rot right out they always girdled in the winter. If girdled in the summer time the tree will always dry up, and it will stand there for years; you may cut them down a year afterwards and saw them up; but the same trees if girdled when there is no sap in them will tumble down in three years. There is that difference in the condition of trees growing and when they are not growing, and there is something about it that we don't exactly understand.

Mr. Smith. Mr. Pearce, haven't you made a mistake and just reversed the thing? If you girdle your elms and basswoods in the winter, any time from December to March, the stump will throw up suckers. Timber cut in June isn't supposed to be valuable for any purpose. I guess you have just reversed your theory.

Mr. Tuttle. I have seen that done in white oak. White oak cut in February will rot, but I noticed the same kind of timber that was cut in August two years ago, and a short time since I saw that the leaves were still hanging to the branches and twigs, and the timber did not rot at all.

Mr. Cutler. I think Mr. Pearce is correct. The tree cut in August has an immense absorbing surface; there is not a large amount of sap coming from the roots at that time, and when the tree is girdled what is left in the tree is very speedily absorbed, and the tree is much more rapidly dried. If cut in the winter, the reverse is true; the sap is in

the tree, it has to dry out through the bark; and the wood will rot before it will dry. There is no doubt but that trees cut during the month of August will make much more durable posts than if cut at any other time in the year.

Mr. Whipple. We are at the cooper business, and I know from experience in that that there is only one month in the twelve when it is safe to cut hickory whip-poles and have them last when they are put on the barrel, and that is in the dead of winter. Then they never powder-post.

Mr. Pearce. I think that is explained by the fact that in the dead of winter there is no sugar in the trees. When the sap starts it forms a starch or sugar, and the worm works in the wood for that. There is a time in the winter when this starch or sap is chrystalized, and there is no sugar about it.

Mr. Sias. Several years ago I saw, about a hundred apples trees girdled, I think some time in June; there were trees probably six to eight inches in diameter, and a foot or more of bark was stripped off clear around. It was done to make them bear early. They were Baldwins and they usually bear very late. I saw the orchard some years afterwards and I noticed that it dwarfed the trees, but they came into bearing several years sooner. I was talking with the proprietor of the orchard about it and he seemed to think it paid.

Mr. Pearce. There is a time about the 20th of June, when if you strip the bark clean off, from the ground up, in twenty-four hours there will be an entirely new bark. At that time the sap is just like glue. It is perfectly safe and is frequently practised in Ohio.

Mr. Sias. I don't know as that is dangerous, but my impression is that it would kill my trees. My grounds are high and my trees require a moist atmosphere. Here it is so much drier that I believe girdling would kill the tree.

Mr. Cutler. I would move as the sense of this Society that the best and safest time to prune is before the sap starts in the spring, after the cold weather of winter is past.

Mr. Kellogg. I would suggest that there is quite a different opinion as to when the sap starts. Pruning, I think, should be done pretty early in the spring; it is better not to let it be too late; the sap starts before the frost is out.

The motion was adopted.

Mr. Gaylord said he wished to find out in some way the youngest man in the house, as he had a curiosity to know how many young men were interested in horticulture.

Mr. H. F. Latham arose and stated that he was twenty-six.

Mr. Cutler said there would be quite a number of younger members present the last day or two of the session.

The meeting then adjourned until Wednesday morning, at nine o'clock.

MORNING SESSION.

SECOND DAY, WEDNESDAY, JAN. 20, 1886.

The meeting was called to order Wednesday morning at nine o'clock by President Smith.

COMMUNICATIONS.

The following letter from Vice President Dartt was read and ordered placed on file for publication:

“OWATONNA, MINN., Jan. 11, 1886.

Dear Sir: Your letter of recent date and premium list received. You may be sorry to learn that I am down flat with what is or seems about equal to a broken leg. I knocked my stiff knee joint loose last Tuesday. I think it is doing well but it is an unpleasant thing to get along with, and I write with the reserved right to be cross, as usual. You say you want a program more than full and a report equal (in size I suppose) to Iowa. A very full program means much hurry and poor work, nothing well done. A big book filled largely by professors and writers on grapes and such, will make the common reader imitate a certain old hen. She was walking in green pastures; she spied something that looked quite inviting; it was round, rather plump, and though it had a greenish cast it looked to her good enough to eat; she tackled it, scratched much, picked very little, finally with a very dissatisfied air went her way. Better have a small, good book that will be thoroughly read than a big one to be scratched over. I am much surprised that your premium list puts the best winter apple on a level with one-half peck turnips and leaves Hybrids and crab apples entirely out.

I have saved some of my Hybrids till now, expecting to exhibit if they kept long enough. I don't suppose anyone would object to their being shown, but few are found who like to exhibit their goods or themselves when they know beforehand they are not appreciated.

You may say to the old members that it would afford me a great pleasure to meet them but I am unable, and as I have not reformed, I congratulate them on being rid of me without paying my expenses to Iowa. Next year they can be on the look out.

Inclosed find membership fee \$1 00. I am under great obligations to you for your kindness and consideration. Hope you will pardon me for my old hen foolishness,

for cripples and fools have a right to fraternize or change from one to the other and claim immunities that do not belong to others. I send a short piece on "Preparing the Orchard for Winter" which you may smuggle into your book if needed to fill up.

Yours Very Truly,

E. H. S. DARTT."

PREPARING THE ORCHARD FOR WINTER.

We have found by oft repeated trials that orchard trees that have been kept in a good growing condition by cultivation and the application of manure as a mulch, each fall or early winter, will withstand the effects of extreme cold much better than those in grass or cultivation where little manure has been applied. The bearing of a heavy crop of apples so exhausts the vitality of a tree that it is illy-prepared for the test of a severe winter. On a poorish soil death is quite likely to follow a very heavy crop. On rich soil more wood buds are produced, rendering the crop less excessive. In extreme cases the thinning out of fruit or fruit branches in the early part of the season will prove beneficial.

Winter-killed trees are often supposed to have died from the effects of blight, because they frequently start in spring, make a feeble, sickly growth, linger for an indefinite time, possibly for a year or two, and then wither and die.

Blight effects trees in a somewhat similar manner, but usually attacks the thrifty terminal shoots during the growing season, and frequently leaves the trunk and main branches uninjured.

We must distinguish between winter-killing and blight; for whilst with Duchess, Tetofsky and other similar kinds manure must be applied liberally to keep up vitality, blighting kinds, like Transcendent and some other rampant growers, might be ruined by it, for excess of manure certainly favors if it does not produce blight. It is best not to plant blighting kinds, but if we have them we should seed down and mulch if at all with old hay, straw or other material not rich in manurial properties.

E. H. S. DARTT.

Mr. Grimes moved that the Society extend to Mr. Dartt its sympathy in his present affliction, but for which he would have been present at the meeting. Adopted.

The following letter was then read:

DENVER, COL., Nov. 16, 1885.

S. D. Hillman, Secretary, etc.

MY DEAR SIR: Yours of 12th at hand. Yes, we will prepare and send a paper on the "Coniferous Trees of the Rocky Mountains, their Value and Adaptation to the Prairies of the Great Northwest." In our opinion there is no profession or occupation in the catalogue of busy, progressive life more refining in its influence or elevating to humanity than that branch of horticulture covered by the propagation and cultivation of trees, fruits and flowers.

We love the plainsman of the Great West, who has caused a tree to grow where

none ever grew before. We honor that brave syndicate of brain and muscle who refuse to be "snowed under," but who through vim, vigor and victory are making Minnesota and Dakota the Agricultural Bank of America, from which we draw our daily bread.

Hoping your meeting will be one of great benefit to your State, I remain,

Truly yours,

D. S. GRIMES.

The report of the Committee on Seedlings was called for and J. S. Harris, of La Crescent, presented the following:

REPORT OF SEEDLING COMMITTEE.

FOR THE YEAR 1885.

January 1st 1886.

Mr. President and Members of the Minnesota State Horticultural Society:

I consider the encouragement of the growing of New Seedling fruits the most important question that has or will for some time come up for the consideration of this Society. It is admitted by every one who has had any experience or observation in orcharding in Minnesota that the varieties of apples at present under cultivation do not fill the bill. For more than thirty years we have been striving to grow choice fruits by purchasing and planting varieties that originated in the eastern and middle states—and whether the trees have been procured direct from eastern nurseries or from home nurseries, have found them wholly unfitted to endure our climate for any great length of time, and to-day we dare not recommend for general planting any of them or any other varieties except the Duchess of Oldenburg, Tetofsky, a few other varieties from Russia, some of the best Siberians and their seedlings, and our own seedling, Gideon's Wealthy. Among the newer Russians that are being introduced there are most likely some that will prove hardy and will produce valuable fruit, but we can hardly expect them to come up to the American standard of excellence, or to prove perfectly adapted to growing in all situations and localities, and we shall earnestly settle down upon varieties to the manner born, seedlings of these, and the best of our others that will be originated upon our own soil from seeds produced here.

As the people of foreign countries do not become fully American by being transferred to this country (although they become valuable citizens) until the second or third generation, so it will probably be with the foreign fruits. High cultivation, careful selection, cross-fertilization and successive planting of the best has been the method by which the greatest success has been attained in the amelioration and improvement of all domestic fruits, vegetables and grains. When we go back and study the history of pomology we find that a most wonderful progress has taken place in the improvement of the varieties of apples (*Pyrus Malus*) that are grown in America, and that it has all been wrought through the growing of seedlings, and that largely without the aid of any skill. A greater degree of skill has been brought into requisition in handling the grape, and the result is that from the sour, foxy wild grape we have the Concord, Worden, Niagara, Duchess, Empire State, and scores of others that suit the American taste and are adapted for cultivation over a

greater part of this country; and a similar improvement is visible in strawberries and other fruits through the impetus that has been given to the raising of new seedlings. These results encourage me in the hope and expectation that we will yet have a list of apples that will enable us to compete with any part of the world, and I see no reason why the horticulturist may not indulge his fancy with the belief that his ideal of excellence will be reached, and Minnesota will soon stand forth first and foremost among the apple growing states.

With the apple in the past there has been but little scientific manipulation, or any great amount of skill applied in the selection of varieties to be used as parents, and yet ninety-nine out of every hundred of the favorite varieties of the country have been originated from seed within a hundred years, and propagated from seed saved and planted without any specific object in view except to get trees and fruit; and therefore we have no data to prove why whole orchards of seedlings are found that are either worthless or defective in some essential points. While we occasionally find some small collections of considerable merit, to me it appears evident that seed selected from young trees that are healthy and under a high state of cultivation, and where they are likely to have been fertilized by other sorts, having desirable qualities in hardiness or long keeping, there will be a stronger tendency to sport into varieties of marked character that will make a radical improvement over planting seeds promiscuously and with no end in view.

I have in previous years made reports to you upon Minnesota seedling apples that have come under my notice, and feel confident that we are making some progress. The winter of 1884-5 was probably the most disastrous to our trees of any one that has occurred since the first settlement of our State, and several varieties of promise have gone to the wall, together with almost everything that was considered "iron-clad." This fact should renew our zeal in making a pomology of our own by the originating of new seedlings. As soon as the season was far enough advanced to enable me to determine the actual condition of the several seedlings that were coming into notice I commenced making observations, through inquiries of the parties owning such trees as had given promise of value, and by personally visiting and examining as many of them as I could without incurring too great expense and inconvenience to myself. I find that nearly all of the oldest trees that were fruitful and good enough to make them desirable are severely injured, and some that were from twenty-five to thirty years old, and that had before shown no signs of injury, were killed to the ground.

A tree upon the George Hartman farm in the town of Hokah is in good condition and produced a full crop of fruit, so say parties who have seen it at times during the season. The fruit is rather below medium in size, of very fine appearance, good for cooking, and a long keeper. Of something over twenty varieties upon the farm of Jacob Kline, town of Union, Hokah P. O., there remain two varieties that did not when I visited them June first show any more injury and even less discoloration than the Duchess in the same neighborhood, and appear very much better than the Wealthy. I have not seen the trees since that date but Mr Kline informs me that they continue to look promising and that they produce fruit of superior quality. The Eberhard seedling of Mound Prairie was seriously discolored and was late in putting out in the spring but has improved during the summer and the owner informing me that he has hopes of its recovery. I estimate its hardiness

to be about the same as Plum Cider. Mr. Kramer's seedlings that had come to fruiting were all quite seriously hurt but he has a number of younger trees that look very promising. The trees of Mr. Wright and others at Minnesota City were generally totally killed, several of them had survived thirty-two Minnesota winters and borne paying crops of fruit. Hearing that the Brett seedlings of Dover Centre fruited last season and that the fruit had been placed on exhibition at the Southern Minnesota Fair, and that the trees were in a promising condition, and believing that they would if sufficiently hardy prove a valuable addition to our lists for Southeastern Minnesota, I in company with A. W. Sias of Rochester, gave them a visit and examination about the first of November. We found three varieties of them that had stood as well as any Duchess in the vicinity, and one of them had cleaner wood than anything I found in Olmsted County. In addition to producing a crop of fruit they had made a vigorous wood growth and the cions of the year were from one to two and one-half feet in length. They stand upon ground sloping gently to the south.

A few varieties upon my own place that are of uncertain origin have stood very well but I do not anticipate that any of them will furnish the coming apple. The choicest variety I had, had been raised from seeds of tender varieties but while some of them were unmistakably better than their parents, all are ruined past recovery. I am informed that friend Gideon is meeting with encouraging success in the originating of seedlings, but I have not had an opportunity to examine them in tree or fruit, and therefore cannot report upon them. It is my opinion that we should make the growing of seedlings a speciality and by every means at our hand encourage the people of this State to assist us in originating that much desired long keeping apple, by saving and planting seeds from the hardiest and best fruit that is produced at home or in the Northwest, whether of American or Russian varieties. Also that we should give more attention to the cultivation and improvement of our native plums and other wild fruits.

Your obedient servant,

JOHN S. HARRIS.

DISCUSSION.

Col. Stevens. Do I understand that as the report of the whole State, or only the southern portion?

Mr. Harris. It includes all the seedlings I have been able to get any track of. At the last annual meeting, on account of the shortage in the funds, the Executive Committee proposed to abandon the idea of having a seedling committee, and I said I would serve alone, and if the Society were short of funds and had nothing to pay for the expense, I would spend all the time and money that I possibly could, and make as many visits and examinations as I could. I have had a good deal of correspondence, besides making what personal examinations I could. The general report is that the seedlings are nearly all dead. I have a card from Mr. Samuel Bates; he says, writing from Stockton, under date of January 12, 1886:

"Mr. J. S. Harris, yours of late date at hand, in reply, would say that my whole orchard or Seedlings and all that ever bore are dead, except the Duchess and a few Wealthy, and they are badly injured, and made no visible growth the past year. I think all the crabs are badly injured but not killed. The bark was severed from the wood on all standard varieties; the sap started too soon in March and then froze which is the sole cause of all trouble.

S. BATES."

Mr. Forster writes me as follows:

"CHATFIELD, MINN., Jan. 12, 1886.

Mr. Harris:

DEAR SIR. I received a card from you wishing to know about my apple trees. Well, my seedlings are killed and so is the Wealthy with me, and about everything else except the Duchess. I do not know of anyone that has any hardy seedling apples. It has been the hardest blow for apples I ever saw and I think we are liable to have a winter every few years that will take our best winter apples; so I don't think it will pay me to belong to the Horticultural Society.

Yours Respectfully,

WM. FORSTER."

That is about the tone of answers I have been able to get on seedlings. If I had had more funds I should have visited Mr. Gideon's place at Excelsior, and some orchards in Martin County.

We have made very little progress in the raising of seedling apples. We must take seeds from the very hardiest varieties and plant them; those seeds must be raised in our climate and in our soil, and then we must select the best fruit from these seedlings, and the seeds from these again must be replanted, in order to get just what we want. But, in the mean time, as I said last night, there is a great boon coming to us in these Russian apples. Just as we accept the foreigner and recognize him as our fellow citizen, so we will accept these Russian apples as "good citizens" now, and future generations will bring out the fruit that will show the good effects of our soil and climate. I believe the day is coming when Minnesota apples will be sent to Europe, and to the eastern cities. I hardly expect to live to see that day, but if the State Horticultural Society will keep on in its efforts; if it will not become discouraged by such failures as has been occasioned by the last winter; if we can keep our courage and look

forward to the bright future which is certainly before the people, I believe that the time will come when our apples will be sought for beyond the great ocean, and when we shall have the merited reputation of producing the choicest apples that can be grown.

Col. Stevens. Mr. President, I would like to amend that report so as not to have it appear as the report of the whole State, it is confined to southern Minnesota. I know very well that Mr. Gideon has over forty varieties that are hardier than the Wealthy. I know very well that Mr. Pearce has a seedling that has proved hardier than the Duchess; last spring there was not a bud injured.

Mr. Harris. This report of the seedling committee is a report of what has come under my observation, and although I believe there is no necessity for it, I am perfectly willing to have it appear as Col. Stevens suggested.

Col. Stevens. I wish to say, as far as I understand the history of the Duchess of Oldenburg, and the Tetofsky, that they are acclimated the moment they are brought to the United States; they become acclimated at once. If I understand Mr. Harris' idea it would take two or three generations before the Russians would be acclimated. I may have misunderstood him.

Mr. Harris. I think you did not understand me. I believe the Russians, a great many of them, are as hardy as the Duchess, and that seedlings from them will improve on the old variety. Apples acquire an excellence of flavor in one locality which they do not in others, just as the Baldwin raised in a certain place is a better fruit than it is anywhere else.

Mr. Fuller. I was working for several years at Cedar Mills, where a number of seedlings were tested. The seeds were planted some fourteen years ago, seeds of the Transcendent, and the Gen. Grant. I was there last summer and saw the fruit. It was very much like the Duchess and about the size of the Gen. Grant. The trees are perfectly hardy, commenced bearing when three years old, and have borne every year since. The tree is a slow grower, it is neither blighted nor winter-killed. I have taken cions to graft and shall watch it with some interest; and another year, if of any value, I can have cions for others.

Mr. Busse. The president of the State Alliance, who resides at Fillmore, told me that he had a seedling apple tree that had borne crops for about twenty years. It came through the winter last year in perfectly sound condition. He said he would send Prof. Porter a few cions of that tree.

Mr. Harris. We heard of a good many seedlings that were said to be hardy, and Mr. Sias went with me and we visited them; when we found the trees they were on their last legs. A man who isn't much of a horticulturist sometimes makes grave mistakes in reporting upon the condition of seedlings.

Mr. Smith. I had a seedling that I thought a great deal of. It was about ten years old when it came into bearing. After the hard winter of 1872, it was then perfectly clean and hardy, hadn't a black spot on it. There is a great difference in the hardiness of seedlings that are raised from the seed of fruit grown here and of those grown elsewhere. I had a little experience in that direction. I traded for a dozen or fifteen bushels of black walnuts, and advertised them for sale, and in consequence, got orders for forty bushels. I thought the black walnut from one place would prove just as hardy as from another and I had a chance to buy some cheap in Illinois, so I sent for them, and they came and I sold the most of them and planted the balance; and every one of those black walnuts, yearlings, killed to the ground the next winter, while the Minnesota black walnut stood all right, every one of them lived and they didn't kill last winter. I believe that trees must be acclimated. I don't think that the Siberian crab is as hardy in this climate as seedlings grown from it will be.

The motion of Col. Stevens was adopted.

The following report were then read:

RUSSIAN APPLES.

By A. W. SIAS, Rochester.

Mr. President, Ladies and Gentlemen:

The past severe winter was just what was needed to thoroughly test the many new varieties of the Russian apple lately introduced. They were subjected to the ordeal of fifty degrees below zero and came out in good shape, with but few exceptions. The latest formation of cells on the new wood, was found in the fall to be well hardened up with starch, or mucilage, while many of the native sorts were spongy and full of sap. The Anis family have proven themselves to be wonderfully hardy. Mr. H. H. Howlett of Baraboo, Wisconsin, wrote me under date of Nov. 28th that what he received for Red Anis fruited last season for the first time, and the fruit was then very hard and had all the appearance of being a good keeper, and if so he would have the fruit here to show for itself. I hope this will prove just what we want for a winter fruit. One of the greatest objections with me to the Russian varieties, is that there is so few good keepers among them. I did have some faith in the Red Black that I exhibited here a year ago, but alas, fifty degrees was too much for it, and it is now in good shape for kindling wood! (This was top worked on

the Hyslop crab.) I have a few small trees four to five feet that came through the winter all right (root grafts). The Longfield was also pretty badly injured with me. It failed to ripen up in time last fall.

Chas. Gibb of Abbotsford, Canada, when at my place in 1883, pronounced what I call the Russian Green, a true Anis. This has proved to be very hardy, and most excellent in quality. Sidney Corp, one of the most successful horticulturists of Wabasha County speaks in high terms of the Autumn Streaked, and an unknown Russian bearing a fruit similar in appearance to the Tetofsky, but will keep perhaps ten days longer. The Yellow Anis also looks well with him. Reports from the Southern, Middle, and New England States, with the exception of Northern New England, are rather unfavorable to the Russian apple. This is all right, and perfectly natural. Our reports in regard to the pears, plums, Baldwins, Mann apples, Shys, Salome, etc., that they are persistently trying to crowd on to us, are also extremely unfavorable. The Russian apple is only completely adapted to a similar climate from whence it came, and that is supposed to be Minnesota. The great treeless plains of Russia are known as steppes, like plains here are designated prairies. It would seem plausible that a variety succeeding well on the arid steppes of Central Russia, should stand equally unharmed on the dry prairies of Minnesota. Planters should know the origin of every tree they purchase, and study its adaptation to their particular soil and climate.

The following paper was then read by Mr. Tuttle, of Baraboo, Wis.

SOME SUGGESTIONS ON ORCHARDING IN THE NORTHWEST.

By A. G. TUTTLE, Baraboo, Wis.

The destruction of orchards during the past year has been very general, not only in the Northwest but in regions farther south and east, where heretofore but little complaint has been made of the injurious effects of the climate.

Eminent horticulturists throughout the country have given their views of the causes that have operated to produce the destruction.

It is well, before suggesting a remedy for an evil, to know something of the causes that produce it. Before giving any views I propose to examine some of the causes assigned.

It is claimed by many that the warm weather in the fall held out so late that the sap was forced into circulation, which being succeeded by freezing, destroyed the trees. If such was the fact why were a very large proportion of the trees injured killed only on the north side while the south half was not injured, and produced a fair crop of fruit. If the sap was forced into circulation by the prolonged heat in the fall it should have been in more active circulation on the south half than on the north half of the tree. Of all trees the Duchess and other Russian fruits should have been the first to start into growth, as they finish their growth earlier and having consequently a longer season of rest, should have been the first to commence growth, and yet that class of trees suffered very little, if any, injury. The Transcendent crab, always the first to put on leaves in the spring, should have been the first to start into growth in the fall, among them we hear of no injury.

It has often been said that trees suffer injury when the warm weather in the fall

does not hold out late enough to mature the wood, so that between too little and too much heat in the fall the tree stands a very narrow chance of living, and were it not true that we have a class of trees unaffected by these conditions we might as well give up the business of growing fruit.

Another reason given is that nurserymen in grafting cut off the tap root, consequently the roots of the trees do not penetrate below frost.

If the hardiness of a tree depends upon the depth its roots penetrate the soil, the pear, of all trees should be the hardiest, for everyone knows that it sends its roots deeper into the soil than any other tree. There was very little root killing of trees by the cold of last winter. I have found the roots of all trees that were killed so far as I have examined them to be in good condition and I can see no reason why the killing of the top should be the fault of the roots, so long as the roots are in good condition. Orchard trees do sometimes, though very rarely kill in the root. Seedling trees that had never been shorn of the tap root suffered equally with others.

As an evidence that they do not require a tap root to insure hardiness we find that trees growing the farthest north, even to the northern limit of tree growth, close upon the confines of perpetual frost such as the fir, spruces and pines do not have any tap root and their whole system of roots is spread just below the surface of the ground, nor does it seem to be necessary in this latitude to insure the hardiness of the Duchess and other Russian apples and crabs.

Trees, so far as I have observed, were not killed in the root by the cold of last winter not because there was no frost in the ground. Trees were top-killed in grounds here adjoining the cemetery where in digging a grave they found five feet of frost. Many claim that the injury was in consequence of there being no frost in the ground.

It made no difference whether the ground was frozen or not, the killing was in the top and the injury was as fatal where they claim there was no frost in the ground, as where there was. Another reason given is that they were in a starved condition and so enfeebled by it that they were easily destroyed.

There seems to have been quite a difference in the kind of trees starved; while one came through in good condition another was killed. I had twenty-five trees of one variety that had been in June grass sod for twelve or fifteen years which never passed a winter apparently in better condition, and bore last season more than double the fruit of any season before.

A tree half hardy may survive under favorable conditions of soil and culture that would fail with unfavorable conditions and neglect.

If ever fruit growing in this great Northwest becomes permanently a success it will be when we have a class of fruits that need no petting and are able to flourish under neglect and extremes of climate, whatever it may be.

As with animals, so with trees and plants, one will live and flourish where another will die.

Many think that the injury done to trees is by freezing and thawing in the spring. In portions of our country where there is freezing and thawing in rapid succession during the whole winter they grow all varieties of the peach, pear, plum and cherry and also the most tender varieties of the apple. In any part of the northern states where the mercury seldom, if ever, falls much below zero all these fruits are

successfully grown, and in many portions this freezing and thawing during the whole winter is similar to what we have in the spring.

There is one other reason given for the destruction of our trees, coming from such high authority and accepted by a very large class of planters that I must not fail to notice. It is the claim made by the dishonest tree peddler, that the reason trees kill is because they are grafted in the root, and that trees budded above the surface of the ground will be perfectly hardy. Any one knows who has had any experience with seedlings exposed above the surface of the ground, that not one in a thousand will prove hardy, and that the seedling root placed below the ground will be much more likely to live than when exposed above the surface. The seedling in the root graft has the same protection we give tender vines and shrubs when we cover them with earth; and then too the hardy cion most of it placed below the surface will send out roots that will ensure the life of the tree though the seedling root should kill.

There always will be probably these traveling sharks prowling over the country doing a large business by pure unadulterated lying. They are even now selling new Russian fruits that they have not even learned the names of, at exorbitant prices.

An eastern concern has made itself notorious by claiming to sell stock of budded trees grown at Sparta, Wisconsin. Whether budded or grafted I am unable to say, but that they were grown at Sparta, Wisconsin, we have positive proof that they were not. I have less respect for a Wisconsin nurseryman who will lend himself to carry on this swindle than I have for the cheap actors in it.

Some twenty years ago I wrote an article on "Orcharding in Wisconsin." It was given as my opinion in that article that the *very extreme and long continued cold* of some of our winters was the principle cause of injury, and now after the lapse of a quarter of a century carefully noting the effect of the extremes we have passed, I am still of that opinion. Every cold winter when we have had many days in succession of very extreme cold, and when some of these days the mercury did not rise above twenty below zero at midday, I have always found injury soon to follow. In every case the extreme cold winters have been those most destructive. If we place a foliage plant in the open air with the thermometer at zero, it is soon killed and we do not hesitate to say it froze to death; so too all agree that the peach kills at about twenty degrees below, and that it is killed by severe freezing. The Baldwin, Greening or Spitzenburg apple kills in a dry atmosphere with about the same degree of cold that destroys the peach.

The winter of 1884 and 1885 was one of extreme cold. Varieties that we had hitherto considered safe to plant were badly used up. I have no doubt that it was from extreme and long continued cold, and yet I am equally confident that there are certain conditions of soil and location and of the state of this, consequent upon those conditions that tend to increase or modify the effects of extreme cold.

From what source are to come good fruits sufficiently hardy to flourish in our climate? Some claim our only hope is from seedlings produced upon our own soil. For forty years we have been planting seeds of Duchess and other hardy apples, and how stands the account to-day? There is not a tree of the thousands produced that can be said to be as hardy as Duchess unless crossed with the crab and have enough of the crab in them to reduce their size and spoil them for market apples.

If we cross the Duchess or any other hardy apple with any of the common apples we lower the standard of hardiness in the seedling produced. If we cross with the crab we generally reduce the size of the seedling and lower the quality.

I have more than a hundred seedlings of Tetofsky, most of which have fruited. They all in tree and fruit show more of the crab than the apple; some are very large and fine for crabs but the growing of crabs and Hybrids is nearly overdone, there being no market for them, or a chance even to give them away. I have several seedlings of Fameuse; some of them have borne a few apples of excellent quality. They came through last winter in good condition, but a few years of trial of trees that have borne a few apples is no test of these hardships and we have no reason to suppose they will prove any hardier than Fameuse.

Some are recommending the general planting of seedlings of only a few years growth because they were not killed by the cold of last winter. Young trees of the Ben Davis came through the winter uninjured. It is no test of the hardiness of a tree though it may have passed unscathed through such a winter as the last, not having borne previously a heavy and exhausting crop of fruit. Two seedling trees have been growing on my grounds for twenty-five years, they had passed all the hard winters during that time and were in perfect condition; they came out last spring with fine, healthy foliage and blossomed heavily. I thought there was a seedling that would do to propagate from and recommend for hardiness; both trees are now dead and with them the last hope of ever producing a seedling from the common apple sufficiently hardy for our climate.

There is a field open for experiment to which I would direct the attention of the careful pomologist. Let crosses be made with pure Russian fruits, the Zolotoreff, a very large fall apple, high colored and very showy crossed with the Repka of medium high color, a very late keeper; or the Green Streaked with the Antonouka, the former high colored and very large, a fall apple, the latter a yellowish apple of good quality and a very late keeper, these crosses would be likely to produce a seedling valuable as a market apple with keeping qualities to carry it into spring. In these crosses Russian with Russian the standard of hardiness would not be lowered, and I have no doubt an apple of great value might be produced.

I am more than ever satisfied that we are to look to Russian fruits and seedlings from them for the future orchards of the northwest.

It is certainly our only short road to successful fruit growing. These Russians have withstood for ages a climate of greater extremes than our own. We may be able ages hence to show as good a collection of hardy fruits produced from seedlings originated on our own soil as are now found in interior Russia. I think it far better however to accept the results of these labors and improve them if we can by judicious cross fertilization.

When we can show as extensive paying orchards as are found on the great plains of interior Russia, we may well lay claim to being a fruit state. It is absolutely certain that those fruits will flourish as well here as there.

I have fruited about sixty varieties of new Russian apples and have about fifty-three more varieties to fruit. Should we find nothing of more value among them, we have enough already fruited to fill the places of all the old kinds that have failed; trees that are as hardy as the Duchess and many of them hardier and fruit of better quality.

I have one orchard all Russian, comprising eighty varieties; every tree except one came through last winter unhurt and are now in good condition. One variety from the Crimea, a country much warmer than this was killed. I doubt whether an orchard be found either east or west of an equal number of varieties showing such health and vigor. This is the more remarkable as the old varieties hitherto considered iron-clads, in ground adjoining were nearly all destroyed. The country from whence these fruits came is an open prairie country, much farther north than the farthest limit of the United States, very much farther from any large body of water, consequently must have more intense cold with a much drier atmosphere. These conditions make it certain that fruits that flourish there will be at home in all the prairie regions of the northwest.

That our trees freeze to death, I have not the least doubt, but why one kills and another does not, is something I don't understand and probably never shall.

Prof. Budd claims that trees freeze to death by the expansion of the sap in the sap vessels caused by severe freezing. This is an old theory and one I could never accept. That portion of the tree containing the sap vessels is as easily frozen as a potato, and I can see no reason why the sap should not be as thoroughly frozen and expanded, with the thermometer at zero as at thirty or forty below, and yet with the mercury at zero we suffer no injury. It is claimed that the difference in the sap cells of the different varieties determines the different degrees of hardness; allowing this to be true, how do we account for the fact that trees of the same variety side by side, one kills and the other does not, or how do we account for a tree being half destroyed and the other half uninjured. If the sap cells are alike and all parts of the tree are subjected to the same degree of cold, the effects of the freezing should be the same.

It is not necessary for us to be able to explain why one variety kills and another does not, the fact is all that is necessary for us to know until we are able to go back in creation to the great first cause and explain the phenomena of its existence. We shall find many mysteries in nature we cannot solve; science can only reveal to us a few faint glimmerings of that effulgent light that shines beyond the reach of human vision. Only in another state of existence, if ever, shall we be able to comprehend the wonderful mysteries that nature withholds from us here.

Let us accept the facts as they present themselves rather than adopt a theory and spend all our energies to make facts conform to it. I made a thorough examination of my shrubs and vines the first day they were thawed after the severe cold in February; the injury was as apparent then as it was a month afterwards.

The evidence was as conclusive to me that they had frozen to death as it would have been had I found a person who had perished in a Dakota blizzard. I would as soon have entertained the idea that the person had died of sun stroke or fever as that thawing killed the trees.

Vines, shrubs and small fruits can be protected, but our orchard fruits, apples, pears, plums, and cherries should be sufficiently hardy to withstand any amount of cold we may be liable to have.

The time may come when we can determine the hardness of a tree or plant by microscopic examinations of its leaves or sap cells, but I have far more faith in the long tests that have been made on the great plains of interior Russia or in this portion of our own country.

REPORT ON RUSSIAN APPLES.

By ANDREW PETERSON, Waconia.

Secretary of the Minnesota State Horticultural Society:

DEAR SIR:—As you ask for a short report on Russian apple trees, I will do so, but of course it will be short because I cannot write the English language myself. As I said in the report last spring, that the Hibernial, Ostrekoff's Glass, Lieby and Charlamoff, these four varieties were not injured by the cold last winter, and bore a heavy crop this summer, rather too heavy, but the fruit was not quite as large as they used to be. I suppose that was because the fruit bud was swelled out too much by the fine weather late in the fall of 1884; and I had a few Wealthy trees that was not entirely killed last winter, and the fruit on them was smaller than they used to be, and also the Crab apples, and the orchards in my neighborhood as far as I have examined them, the fruit was a good deal smaller than it used to be. The Duchess of Oldenburg was a good deal damaged but not killed, and bore a heavy crop. The Russian White Astrachan is nearly a Duchess, but not quite; in tree and fruit seems to be hardier than the Duchess, and is a good bearer.

The Winter Lowland are hard trees, have bore a few apples this summer, the fruit middle size and middling good quality; not a winter apple, but late fall. Red Cheeked apple bore a few apples this summer for the first time, size of fruit some larger than the Transcendent but sour; good for a cooking apple; the trees are the hardiest I have seen. When the wood of the Transcendent took some color last winter, these Red Cheeked trees did not take any color at all. The small Russian trees that I received from Prof. Budd most of them stood the winter good, but some varieties were damaged more or less. The Red Anisette were not injured at all, and neither was the Antanouka.

The pear trees I received from Prof. Budd were colored some, but not much, and also the Russian plums. The grapes I raise are Concord, Delaware, Isabelle, Hartford Prolific, Iona. All bore a heavy crop, and a very heavy crop. Of the raspberries the same may be said of Philadelphia and Turner.

REPORT FROM CARVER COUNTY.

By CHAS. LUEDLOFF, Carver.

No previous winter has been so severe on fruit trees as the last one and new and extensive demands are made upon the pomologist to regain what has been lost. Many causes, which are injurious to fruit trees, can be removed by a scientific pomologist, through remedies which by experience have proven to be valuable. But other causes, which in their operations are harmless to the tree, cannot be overcome or guarded against; such are the extreme cold during the winter months; or the heavy frosts in the spring, or fall, before the sap had matured the wood. If this is the case, then we must endeavor to assist nature in accomplishing a restoration.

The injury done on fruit trees last winter was not alone caused by extreme coldness, but is more largely due to the fact that the sap had not matured the wood of the tree sufficiently. The sap froze into ice, and the effect of this was to cause

bursting of the sap cells, and it became, for this reason impossible, or better said, perhaps difficult for the sap to recede. By this expression the sap "recedes" the gardener will understand that when the sap thickens and with difficulty passes through the cells, a condition is produced causing leaves to fall; and the pomologist should then observe the maturity of the terminal buds. An equally fatal occurrence for fruit trees experienced happening here last winter, happened in the year 1829, in Germany. In October of that year the fruit trees were in "full sap" when a cold spell, accompanied by a snow storm, set in, the snow remaining until the month of April following. The prune trees ("*Prunus domestica*") were mostly all destroyed, and apple and pear trees had to be cut down. Some nurseryman adopted the plan of top grafting but the expedient totally failed; all trees were killed to the snow line.

This shows that here and there, at great intervals, such disasters will occur, but it should not induce us to stop the planting of fruit trees, or the raising of fruit.

The loss of trees on my place is great; different kinds which have withstood severe winters heretofore are dead. Top grafted Russian varieties, Minnesota and Wisconsin seedlings, are all destroyed. It is my judgment that top grafting is not advisable; we thereby get no hardy trees, and such trees are the first to die.

Our hardy kinds should be replanted, and the approved Russians also; replacing with root grafts, or yearlings, would be the best. I think it not advisable to transplant two year old trees which have partially withstood the last winter. Such trees are subject to the "black-heart." My yearling trees were transplanted by cutting them back to sound wood, and with two year old trees the same process would be beneficial.

The kinds which withstood the winter best are: Russian Green, Ostrekoff Glass, Lieby, Kurski, Smelling Apple, Round Wassen, Arcade, Switzer, Charlamoff, Beel, St. Peter, Milton, Red Lake, Lake Winter, Whitney's No. 20, Dart's Hybrid.

The Bessemianka Pear trees were killed to the snow line. Ostheim Cherries came through the winter all right. Plums of our best native varieties all sound, and brought a heavy crop. Blackberries, Doolittle, Seneca, and Mammoth Cluster were killed to the snow line. Gooseberries, Downing's Industry came out all right. Also the Currants, White and Red Dutch, Grape Currants, Fay's Prolific, all bringing a good crop.

Strawberries were uninjured and brought a heavy crop. From the different kinds I had on trial I find the best adapted for my location the following: Glendale, Champion, Crescent, Green Prolific, and Wilson.

I find no injury on grapes, and think we have nothing to fear hereafter when they are properly covered with earth. From the many kinds I had on trial I find the best for my location and soil the following: Progress, No. 30, 33, 43, Lady, Grein's Extra Early, Minnesota Beauty, Cambridge, Rochester, Telegraph, Martha, Hartford Prolific, Worden Seedling, Moore's Early, Concord, Miles, Delaware and Aminia.

Berbaris vulgaris were killed to the snow line; the *Rhamnus Catharticus* (Buck-thorn) near by, came through the winter all sound making a robust growth and produced a fine show of its fruit in the fall. This and the *Caragana aborescens*, also the *Juniperus Virginiana* (Red Cedar) I consider the best hedge plant for our climate.

DISCUSSION.

Mr. Harris. Mr. President, I consider these four reports that we have received of very great value to the State of Minnesota.

On motion, it was carried that in speaking each member be limited to five minutes, and to speak but once upon a subject until all who desired to speak had spoken.

Mr. Harris. One of the gentlemen spoke about the White Astrachan coming out perfectly well with him. I supposed it to be the hardiest apple we have; but last spring I visited one tree that was perfectly dead; so that it is not perfectly hardy under all conditions.

Mr. Tuttle. I want to say that the White Astrachan as commonly known is not the real White Astrachan, according to the description given me. The tree that I received from the Agricultural Department I think is not the true White Astrachan. It resembles very much a tree coming from the department under the name of Gen. Grant. It seems very hardy, and was not hurt at all last winter.

Mr. Pearce. I think this is a question that ought to be discussed very thoroughly. The propagators of these Russian fruits who have handled the trees are perhaps most capable of forming a correct idea of their value. I was very much pleased with the report of our friend Mr. Tuttle. Some pretend that the spring freezing kills our trees; others say that the extreme cold of winter kills them.

In the last few years some people seem to have formed the opinion that it is the hard winds that kill the trees. The Russian varieties are generally very early; they mature their fruit early; they cast their leaves early; on this account last season they were injured after the buds were out. The only objection is they are short lived; they may live five, six or seven years, but I will guarantee that time will bring them. Here is the Yellow Transparent, and I might say forty or fifty varieties that were scattered over this country ten or fifteen years ago; they bore fruit; people thought they had a good thing. There came such a year as last year, and the result was almost everything was killed. I knew one variety that was apparently adapted to that particular kind of soil where it had been planted; it continued longer in growing than the others. Now, those same varieties on high lands have come through, generally, in good condition. I have examined trees all over the country, and have observed this to be true; while on the low land, in warm localities, all the varieties of the Russians were injured, especially the White Transparent.

Mr. Tuttle. I have understood that the tree that is called the Trans-

parent is not the true Transparent. I grafted ten thousand trees that were sent to me as Transparents, and out of that ten thousand there is not a tree that is worth a cent—not one. You can pick out the rows standing in my pasture ground where the old trees stood in the nursery. You can't find one tree in fifty but what is killed. Part of the Tetofsky are killed; it is an apparent failure, but it is no test of the Russian apples in general that this one variety kills.

Mr. Sias. I believe what we want is to get grafts of the Russian apples. Mr. Tuttle has touched upon an important subject in his paper; and I am very glad he has had the courage to mention it, for writers generally feel a little delicacy in speaking of it, as their motives might be misconstrued, and that is the reference to foreign nursery-men bringing in and selling, under fancy names, all sorts of things. In Dayton, Ohio, and that vicinity they have more extensive nurseries than almost any other part of the country, so far as I know, and they send a great many men into this Northwestern country. They come here, and find a man that has some little reputation for doing an honest business, and they want to sell their miserable stock on his reputation. I have been interviewed several times by these same parties and asked to allow them to use my name to sell stock. They said if I had a surplus of anything of course they would buy some of it; but they wanted to use my name in selling stock, and have named parties in the northwest that were doing the same business, and said they thought it would make it mutually profitable to do so. Of course I have always answered these fellows that I would allow no one to use my name unless they had my stock along with it.

One of these fellows called a few days ago to talk with me; I asked him what varieties he was selling mostly; he said they were running heavy on the Mann apple and the Pewaukee, and that class of fruits; and they were selling a great many of the Irish Juniper, etc.; I told him he was doing wrong; they were entirely worthless, and I had seen them tested, and knew they were all of no use whatever. A year ago I told a fellow the same thing, and I found out that he had sold some hundred of them to my neighbors. So you see how it goes; all they want is your money.

Mr. Latham. The buyer goes and gets his trees, and the agent goes into another section of the country. I don't think that these Ohio men always come to nurseries to ask permission to use their name in selling stock. During the past season we have talked with farmers in the vicinity of the Excelsior nurseries, who have been solicited by for-

eign agents and who said that they represented themselves as selling for the Excelsior nurseries. I am aware that in this discussion of Russian apples, much has well been said about the varieties that have not succeeded, but I want to know what varieties have succeeded. I would like to plant a few more of them; I would like to try those that have done the best. Of about forty varieties of Russians on my place the most of them were root grafts; they came from the scientific department at Washington some twelve years ago. Those I grew in the nursery and transplanted into the orchard; they were well cultivated and cared for, the same as the Wealthy. The Wealthy came into bearing, and they did not. For the past three years I have noticed that two of these trees have made a very vigorous growth. They attained about the size of the largest Wealthy; they appear much akin to it; I can hardly tell them apart. The trees were not seriously injured by the severe winter. The other 25 or 30 varieties have borne scarcely anything; some of them are blighted badly. The leaves are smooth, and have an unhealthy color, but I hope something may come of them yet. I have perhaps twenty others that were top grafts on the Duchess. They are all alive, and most of them have borne fruit. There is nothing very nice among the fruit however. When perfectly ripe they are as good as the Duchess; perhaps not quite as sour. When not quite ripe, there is a little bitterness about them, that condemns them for eating. It bruises very easily. I don't think it is an apple that could be handled. It is a valuable apple for home use, but I don't think it will be valuable for the market.

Mr. Tuttle. I mentioned these trees particularly for the reason that they show that the root grafts are better than the top grafts. When a man sells a thing that I know is worthless by means of persistent misrepresentation, and at an extravagant price; for instance, the Russian Mulberry at \$1.50 that costs him five cents, I do not wonder that people lose faith in fruit growing. Every seedling that is grown has to go through years of testing and trial.

Mr. Sias. Mr. President, there has been considerable said about the quality of the fruit of these new Russians, and I would like to see this matter put to a severe test. I don't want to propagate an inferior variety when I know it, and I would move you that the Chair appoint a committee of three to meet during the time of the State Fair and select half a dozen of the best Russian apples, and a like number of the very best natives, to compare them carefully, and report at our next annual meeting upon their comparative merits. It is an important

point. If these Russian apples are worthless, we should take measures to have the facts ascertained at once.

Mr. Harris. Mr. President, I am very glad to second that motion.

Mr. Busch. Thirteen years ago I grafted a good many Russian cions on crabs, and my neighbors did the same, almost without exception, and now they are dead. Last spring I sent to Prof. Budd for trees of these newer varieties. He sent me some thirty-five varieties, and most of them seem to be good. A few came out in good shape through the summer, and some did not. One kind seems to be blighting so that I don't depend much on them. Now, as to quality; I am not yet satisfied as to the quality. We don't want to grow hardy apples and have to feed them to the hogs.

Mr. Kellogg. At our state fair in Wisconsin, we had an exhibition of about sixty varieties—I haven't the numbers with me now,—of the new Russian varieties, don't count the Alexander, and Tetofsky new Russians any more; of these fifty or sixty kinds I think there was at least ten or fifteen that came up in quality to the Duchess, Fameuse and Wealthy, and that class of fruits that are considered to be hardy.

Mr. Tuttle. I would say that Mr. Kellogg was chairman of the committee on apples at our state fair, tasted the fruit, and satisfied himself as to the quality.

The motion of Mr. Sias was adopted.

Col. Stevens. I have a short resolution which I wish to read now, which the members can be thinking about, and it can be taken up later:

Resolved. By the State Horticultural Society in convention assembled, that J. S. Harris of La Crescent, A. W. Sias of Rochester, and George W. Fuller of Litchfield, be and are hereby appointed a commission to visit all portions of the State during the early autumn of 1886, for the purpose of thoroughly examining the different seedling apples and other fruit trees, and plants, and to report the result of their labor to the Society, at its annual winter meeting in 1887.

Resolved. That the sum of \$150 not otherwise appropriated, be and is hereby appropriated to defray the expenses of said commission, in gathering such useful information as they may deem of value to the Society.

Mr. Kellogg. I think that the following varieties of the Russian apple are equal to the Wealthy: The Transparent, which comes under five different names, the Yellow, Red, White, Red Cheek, and Charleton Thaler; those are all one variety; the Summer Lowland; Roland Raspberry, Green Streaked Raspberry, Yellow White, White Russet, and the Reptka, which are varieties as good as any that I know of that have been mentioned in our discussions.

The Chair named as the committee on apples at the State Fair, Messrs. Wyman Elliot, Prof. E. D. Porter and H. H. Young, Secretary of the State Board of Immigration.

Mr. Tuttle stated that he would exhibit specimens of the Russian apples at the next State Fair.

Mr. Latham. I would like to see them exhibited, with a section of the wood, showing three or four years' growth. I have no doubt that many Russians are doing well, and winter well. I had a few bushels this year that were almost worthless for eating; my family would not eat them; they took apples from the market instead. And so I say let us have the Russian apples from this section with specimens of the wood, so that we can see what the apple is as grown here.

President Smith. I would suggest that we offer premiums on apples with samples of the wood accompanying.

Mr. Elliot. It seems to me that we have taken a good deal of time for this Russian apple discussion, and we ought to get to our premium list pretty soon.

President Smith. The next order of business will be discussion of premium list at the State Fair.

THE PREMIUM LIST.

Mr. Harris. Mr. President, it has been impossible to get anything like such a premium list at our State Fair as we ought to have. The whole time of the executive board of that association generally is consumed in looking after the interest of the blooded horse, the Short-horn, and Jersey cattle, and when they get down to the premium list of fruits, it is the last thing and the money is about exhausted. I think we ought to appoint a committee of about three to prepare a premium list on fruits, and demand an audience with the executive board of the State Fair association.

President Smith. I am tenacious upon this point. If we go in with that Society, with the state appropriation entirely in their hands, we have nothing to expect from them. I hold that this Society should at this meeting make out a premium list, or instruct our Executive Committee to make out a premium list, present it to them at their meeting next Tuesday, and ask them to furnish funds to pay these premiums. If they expect us to join hands with them, they should understand that we, as the oldest society in the State, are entitled to this consideration. Let us make our premium list liberal enough so that it will be a benefit to the whole State of Minnesota, and not one that will benefit one or two nurserymen, and exclude everybody else. Let us have premiums on single plates, and upon articles of merit; and present a premium

list that will show to the world what Minnesota can do. Then if you want to offer premiums upon sweepstakes, do so, but let us ask them for what is our right, and if we cannot get it, let us apply to the legislature next time. That, gentleman is the position I take in this matter. We are not begging in this matter; we are helping to build up this State. We have helped to build up this Society and have helped to build up that as well; and we propose to work hand in hand with them, but we want them to show us some consideration as a Society. I ask nothing for myself, and this matter should not be in the hands of the President and Secretary; but it should be in charge of a committee of three, which should be selected with care; and they should decide what amount will be required to make liberal premiums, and then they should demand of the Agricultural Society funds sufficient to pay that list of premiums. I would say make our premiums liberal if we have any spare funds. Now that, gentleman, is my position on the premium list; and I think it is one of the most important matters to come before our Society.

I suggest that we would increase the interest of the people generally by offering premiums of subscriptions to an agricultural paper, or by offering premiums of membership in this or in the Agricultural Society for one year. It will save funds for our Society, and help to save funds to the State Agricultural Society, and help increase our usefulness as a Society. That is the object of our Society—to throw the seed broadcast, to each and every individual in the State. This Society is not organized for the benefit of St. Paul and Minneapolis alone, it is for the whole State of Minnesota.

Mr. Smith. I think that is exacty what we want. As Mr. Harris said, at one time last year it looked as if we should have a good premium list. I advocated then that the premiums should be placed on all such things as the farmers can raise through the entire State, and should be so arranged that there would be a great number of them, and on a large variety of these products; that they would be scattered throughout the State. Another thing that should receive our attention is the giving of premiums on small fruits, preserved in liquor or sugar, or any other form so as to bring them there. Now, at the time of the State Fair, currants and strawberries of course have gone by. Still we might have specimens of them exhibited, and there should be a statement with these in regard to the variety, the locality where they were grown, the amount produced, and the conditions under which they were grown. This idea of having specimens of the wood accom-

panying the apple I think is a good one. I will offer this as a resolution, that the Executive Committee be instructed to prepare a premium list to be submitted to this Society, not later than Friday morning, for approval and amendment, which premium list that committee shall present next week to the Agricultural Society with a demand of recognition by that Society.

President Smith. We want the list prepared and published in our reports.

Mr. Gould. I would recommend that the committee go to work as soon as possible and get it ready.

Col. Stevens. Mr. President, I apprehend there will be no difficulty, as far as the State Fair Association is concerned, in granting us all we claim. Heretofore the Society has been handicapped, they hadn't funds to make such appropriations for premiums as they would like to do. Until the past year officers of that Society and some of the stockholders have been members of this Society, and have always been in favor of making as large premium lists as their funds would allow. I am very well convinced that the Executive Committee of that Society have a friendly feeling towards the State horticulturists. We have had Mr. Harris to represent us there, a gentleman who is favorably known throughout the whole State, not only in the interest of horticulture, but in the interest of agriculture as well; and I think that if we in a gentle manner make known our wants to them, that they will grant them at once. It has been exceedingly necessary in the past, and it is necessary now, that everyone should do all in his power to advance the interests of the Minnesota State Agricultural Society, especially when its fair grounds are located as they now are, within the easy reach of these two big cities, and when our railroads are extending to every neighborhood in the State. It is necessary that we do all we can to sustain that Society, and at the same time to help ourselves.

President Smith. I would state that the horticultural exhibit has always taken place entirely under our charge up to two years ago. Why they should change, that I don't know. I took it for granted they had something against me as President of the Society, and I tendered my resignation when the Agricultural and Horticultural Society had met in conjunction, but that resignation was not accepted. They never printed a premium list until the 12th day of August. I spoke to Mr. Clarke about it, as President; he said they hadn't thought anything about it. They thought the Society of Horticulture was of very

little importance. I think we should prepare our premium list and present it to them with a request for the funds to pay it, so that they cannot have a chance to say that they didn't know what our wants were.

Col. Stevens. That is right.

Mr. Smith. If the amount appropriated to the Agricultural Society had been increased, a proportionate sum should be due the Horticultural Society, whether that amount of money is \$2,000 or \$500; in the hands of the Horticultural Society the same amount of money would go twice as far. No extravagant amount for premiums should be asked, but what is due us we should have; that appropriation should be under the control of this Society, and its Executive Committee.

Col. Stevens. I fully concur in what our President has said. Last year the Agricultural Society took in between \$50,000 and \$60,000. It paid off a debt of some \$20,000 or \$30,000 for its buildings. They have got money in the treasury now. I suppose next year they should take in the same amount of money; probably they will; and if they do, we certainly should be entitled to get our share of that, so we would be entitled to \$5,000 perhaps. That would leave them \$45,000 or \$50,000. I don't suppose the Society wants to get money in the treasury, to any extent, hence we could rightfully ask them to be reasonable, and give us, say \$5,000. With that sum we could make a grand exhibition which would do more for us than ever has been done.

Mr. Elliot. I have had some experience with the State Agricultural Society. I have had the pleasure of being one of the board. I have seen the same question come up before the Agricultural Board and the way that they treat it. I will venture to say that we don't get a thousand dollars.

President Smith. No; what has been the record in the past? We have never been able to get over \$500 or \$700.

A Member. The only way for us to do it is to make up our premiums, not an extravagant list, but make such a list as we shall not be ashamed of, and put it before that board, and if they do not see fit to accept it, let us not hold any fair.

Mr. Smith. Or, if they do not accept it, let us go to the Minneapolis Exposition, and ask them what they will give us.

Col. Stevens. Never!

Mr. Pearce. I am interested in the State Fair, but it is my opinion that the Agricultural Society know no other society except their own; they don't know the State Horticultural Society. They expect to go

to work and make up a premium list all the way through, including horses, cattle, sheep, bulls, and everything else. But we are just as independent as they are, precisely. We can hold our own fair, and we have the money to do it; and we have the right to do it just as much as they have. But if the thing can be arranged satisfactorily, and we get what is our due, I say go in; if not, stay out.

Mr. Kellogg. Mr. President, I don't believe in being too gentle in approaching them about this matter. Make up your premium list as high as you think proper, and say that your Executive Committee shall have control of it. If they make their premiums \$25 on horses, put that down as the first premium on fruit.

Mr. Harris. Mr. Kellogg has expressed my ideas exactly. If they don't want our exhibits enough to give fair premiums, let us have a fair of our own. I would rather attend a horticultural fair here in Minneapolis, even if I failed to get a dollar, and know that I stood on an equal footing with the other exhibitors there, than to go into the State fair where the horse and the bull receive a \$25 premium, and the apple, which represents the care and attention of twenty years in bringing to its present perfection, gets only an insignificant sum of a dollar or two.

Mr. Gould. I think we should take a reasonable view. I think the only thing to talk about is to hold our fair in conjunction with the State fair. There is a larger number of people that contemplate going there than on any other occasion, and they expect, more or less of them, to see all there is to be seen—all of the fruits and products of the State that are worth seeing. Some of them come a long distance. One may go to see the fruits, or perhaps some one kind of fruit; he may be interested in apples or grapes, another in small fruits; but each one expects to find what he goes to see, and for that reason it affords the greatest and best opportunity for a general inspection at a State fair. Now, we could have a little one-horse thing of our own. We might get great satisfaction out of it; but the people at large would not see it; it would be out of their reach; they couldn't afford to come from a distance just for that. But they all come one day in order to see the State fair; that is the place that attracts the crowd. Now, I think we may as well drop the idea of exhibiting independently and make the best terms we can with the management.

Mr. Harris. I don't think we will have any difficulty at all in making satisfactory arrangements.

Mr. Gould. I think we had better offer liberal premiums. There

has been no inducement to the Society or any member of the Society to take pains to improve exhibitions, because the premium list has been somewhat light. The fast horse, or blooded bull, and other favorite animals get liberal premiums; there has been too little money reserved for premiums on fruit. I think that now, the way the State Agricultural Society is fixed, they can be and will be more liberal, and I am in favor of giving a pretty large and liberal list.

President Smith. We do not wish to propose an independent exhibit, but this Society should request of them that our premium list be adopted.

Col. Stevens. I am a member of the State Agricultural Society; so is Mr. Elliot, and Mr. Harris, and Mr. Grimes, and several others here. I think if we don't get what we want it is our own fault. Let these gentlemen attend the meetings of the Agricultural Society and tell them what they want. This Society has a member on the executive board of that society; I have been a member of the executive board, Mr. Elliot has been, and Mr. Harris has been; so we are as much to blame as they are.

Mr. Elliot. The representative of the State Horticultural Society on that board has four to contend with; he has the secretary and president to contend with, and as a general thing the president of the society is a stock man; he has been for years; his interests run in that direction; they don't run to horticulture, and it is almost impossible to get anything for horticulture. They will give you a certain amount; they will take the old premium list and say, "Well we want about what we had last year, I should say; if the State Horticultural Society wants to give any additional premiums to what they had before, they can do it." In that way we are shut off, and I think it is about time that this Society made up a premium list and presented it. I would like to have any member of this Society put in our question box what he would like to see premiums offered upon, and let the Executive Committee take those suggestions and arrange them. I don't know that they can get to it to present a full list between now and Friday morning, but they will be able to present a premium list at the annual meeting for them to act upon; and in that way we can get something.

Mr. Smith. I think we ought to put this matter squarely before the Agricultural Society, and ask them for a full and fair recognition on their premium list, such as we are rightfully entitled to, and if we don't get it I believe that sufficient can be raised from other sources,

if the Executive Committee of this Society will take hold of the matter, they can have a fair that will not only be a credit to fruit growing and horticulture, but that will bring us enough to pay all premiums; but I believe that they will come to our terms when we go to them in a proper way and demand our rights.

Mr. Harris. I don't think we will have to entreat them very much to get a good show.

Mr. Latham. I think the Executive Committee should be given some discretion in the matter. Suppose we make up a premium list and present it, and they refuse to consider it. Are we going to tell them that we will get up a fair of our own? You see what sort of a position that would place us in. The Agricultural Society would hold their fair, and they would still get up a very good horticultural display, and then what will the Horticultural Society do? I think that we had better approach them in an amicable way, and adjust this matter.

Mr. Busse. The people of the whole State are interested in this subject; the State fair grounds have been paid for by the State, and it is the duty of this Society to present them our premium list; if they object, ask them to state their objections. Then if our Executive Committee can agree with them, the premium list can be modified so that it will be agreeable to the members of the Agricultural Society. They should harmonize this matter for the best interests of both Societies.

President Smith. I don't think that anyone here intends to go there in a spirit of dictation, or believe that our Executive Committee should make their demand in an arbitrary manner. But we want to make our wishes known in a way that will be thoroughly understood.

Mr. Latham. I would offer the suggestions that the Horticultural Society have erected a suitable building for our exhibits. I think that suggestion might well come from this Society.

President Smith. I suppose that would have to come in after the next Legislature meets; I don't suppose it is feasible at present. We shall have to put up with such accommodations as we can get. The ground is staked out for a very fine Horticultural Hall there, and whenever the funds are procured, it will be ready.

Mr. Cutler. I would suggest that the horticultural exhibit be placed where it was last fall, in the main building. I think they can give us enough room in that building to have our display, if they are willing to.

President Smith. I would suggest that the whole thing be left in the hands of our Executive Committee.

QUESTION BOX.

The following question was then read:

Has any one in Minnesota been humbugged by Iowa nuserymen? and if so, by what firms?

Col. Stevens. Mr. President, I have had a pretty large acquaintance with the nurserymen doing business in Minnesota, perhaps more so than any other man, in consequence of my business connection. I never have heard the first word of complaint in this State of an Iowa nurseryman.

Mr. Harris. And I believe I can say the same.

Mr. Gould. The thing seems to be all one way. I would like to know if anyone has heard of any humbug nurserymen in Minnesota.

Mr. Gaylord. I will say that I think that you have got a good many better men up here than I have got behind me.

The next question was, How should root grafts be cared for?

Mr. Harris. Mr. President, I think the subject is of such importance that we ought to ask some experienced man to write an article upon it.

Mr. Tuttle was called for.

Mr. Tuttle. Most anybody can graft a root graft. It is a very easy matter. The parts will very readily grow together. The principal difficulty I have is in preserving grafts in good condition after setting. My practice is to pack them in sawdust. It is important to have the right degree of moisture. I get it as it comes from the saw; if too dry they will come forward too quick.

In setting, care should be taken to set them so that the lower end will be solid in the ground; when it is loose it will not grow. I have seen grafts set sometimes when I could take hold of the top and shake it. Set in that way there will not one in twenty grow.

There is one thing that I have observed. We used to use wax in grafting; we finally got to using twine or simple cotton yarn, waxing it, running the thread through the wax and twisting it on. We practiced that a number of years. Finally, I didn't think there was any benefit in the wax, and since that I have used the simple cotton yarn without any wax, and I never had any grafts grow better; it is all nonsense about wax.

A Member. About what temperature do you keep the grafts?

Mr. Tuttle. Well, about as cool as you can keep them without freezing.

A Member. About thirty-five or forty degrees?

Mr. Tuttle. Yes; the cooler you keep them the better. I generally enclose my cellar and keep it shut after the warm weather commences; if we have pretty cold nights, I open it at that time and shut it up in the day-time.

A Member. Do you form a union by splicing the graft?

Mr. Tuttle. Yes, sir.

Mr. Pearce. Did you ever graft without any string at all?

Mr. Tuttle. I have grafted without any string at all, and they grew very well. I did it just for trial. The object of the string is to hold the grafts in place. They are easily put out of place, and in packing them some of them would move out of place, and it is merely to hold them together that the string is used. They will grow together with ordinary care. You must be careful not to disturb the union when you are setting.

A Member. Do you use any mulching?

Mr. Tuttle. No, sir. The great thing is setting the grafts. There are ten times as many lost in setting as in anything else. We have a dibble that we press into the ground; we put the graft in and press up the dirt so that the graft is set perfectly solid.

Mr. Sias. I never undertook to graft either root grafts or top grafts with it wax until 1883. I learned that while on a visit to Mr. Tuttle's place; that was the first I heard of it—and since then I have practiced it myself with satisfactory results. I will say, in regard to sawdust I have always supposed that the sawdust, just as it came from the saw was about the right degree of moisture; but it is frequently thrown out of the mill, where the snow and rain gets on it, and is frequently much too wet. That is all the difficulty I know of in regard to keeping root grafts.

Mr. Gould. I suppose the question was asked for the purpose of getting information so that farmers would know how to raise trees from root grafts. I will say as far as I can gather from my own experience in the matter, that the grafts should be planted firmly in the ground; that is, the bottom of the root should be planted in the earth. The earth should be worked deeper than the bottom of the root; that is very important, because if it comes on dry, down in the hard pan, they are almost sure to die—would not live through July if there happens to be a dry spell. When the grafts start in June, they should be watched carefully to see that there are no little worms on the leaves; if the leaves are touched, the worms will drop on the ground and it is difficult to find them. There may be two or three of them about the

same size, some green and some gray; they destroy a great many young trees some years, and there are always more or less of them.

Col. Stevens. I move this discussion be continued. I understand that the distinguished fruit-grower from Ripon, Wis., Mr. C. H. Hamilton, is present, and I move that he be requested to take a seat on the floor and participate in our debates and proceedings, and that the committee on hospitalities see that he has a pleasant home while he is with us.

Both motions were carried unanimously.

Mr. Barrett, of Brown's Valley, being called upon, came forward and said:

Mr. Chairman and Gentlemen:

I confess that I feel some misgivings, seeing that I am just beginning in the work,—that is, professionally, (though for years I have been engaged in the business, in a small way, in Wisconsin, where I have given considerable attention to horticulture),—but I say I have some misgivings in trying to make a report to men of many years' experience who know more than I do about these matters; therefore, if my statements are not found to be correct, I shall thank you if you will set me right. I will state that I reside in Traverse County, Dakota, a new county that borders on Lake Traverse on the east. Brown's Valley is on a neck of land on Lake Traverse.

Mr. Barrett then proceeded to read the following paper:

PROGRESSIVE PRIMARIES FOR FRUIT GROWING.

By J. O. BARRETT, Brown's Valley.

A great diversity of opinion prevails in the new county of Traverse and its environment, respecting the permanent success of fruit and fruit plants. While there are cases of sheer neglect, compelling plants to "live at a poor dying rate," the careful observer will also notice a marked difference as to their health and thriftiness even in localities where they are properly cared for, with good drainage and similarity of soil, both in hardness and culture. On some rightly managed claims, forest trees do well, while on others, equally favorable to all appearances, a heavy per cent of cottonwoods die out year after year, even when they have attained quite a large size; so of the box elders, the soft maples and other trees. An experienced tree man of that county, formerly proprietor of a nursery in the East, says: "It is safe to calculate, that, as a rule during the eight years allotted for proving-up, the entire ten acres have to be the same as reset to insure success."

What obtains with our forests trees obtains to a more marked degree with our fruit plants. Seldom does a first experiment prove a success. This is the experience generally, even with those who are posted in horticultural art. We have all

learned that we cannot safely use the same methods as in the East whence we came, and have to be very particular as to the variety and institute adaptable methods with the expectation then of early cremating a goodly number of our costly candidates. A well-to-do farmer, resident in that county, who formerly made orcharding a business in New York, said to me the other day, that he was "utterly discouraged in trying to grow apple trees, cherry, or even small fruits." Last spring, from the same lot of crab and apple trees, two years old, consisting of the Whitney No. 20, the Wealthy and Duchess, I sold different amounts to men whom I personally know are posted in the art of fruit growing. While most of them reported in the fall that their trees had lived, timbered well, and promised safe wintering, others, whose orchard localities appeared every way favorable, reported that, while many of the trees lived, they did not grow, scarcely any timbering out to any appreciable extent. Though failure is the rule thus far, we have beautiful exceptions.

A gentleman by the name of Bowman who lives on the shores of Big Stone Lake, a very candid man, said to me last fall that he had raised seventy-five bushels of apples; that among the varieties he was growing were a number of trees which he had brought from the East: he also said that those trees then in bearing were producing some of the best apples he had ever seen. He was a very modest man, but from his report I should judge that he has some valuable fruit.

In special localities we have some thrifty young orchards, yearly bearing fruit, some of the trees native, from the seed, with fruit equal to the best. Crab-apple trees do finely in our alluvial soils that are well drained and kept friable, wherein is embedded and rotting the bones of buffaloes and other wild animals, washed in from the plains above. The exceptions keep our hope alive, that in due time, with unfaltering perseverance, success will crown the enterprise. As respects small fruits, discouragements obtain, but not so generally as with apples.

The diverse results of experimentation are by no means circumscribed to our section of the State, but, so far as I can learn, characterize the newly cultivated regions of our prairies west of the big woods, and over the vast domain of Dakota. Our soil is rich, under it is a clay stratum to hold the moisture, and every year's tillage better fits it for high types of plants. Though we are but a few years old, as prairie farmers, we have come to the conclusion that we must vary our crops and give more attention to stock raising and the dairy, as fundamental to feeding our soil with proper pabulum wherewith to develop next the fruitful orchard and garden.

Obviously there is no uniformity in the constituents of our soils. Some localities, doubtless, have an excess of what is vaguely called alkali; others are deficient in this respect. Silica may be wanting here and there, or where abundant, there may not be enough potash to hold it in solution for available appropriation. Though iron properties are not wanting, they may not yet be chemically fitted to feed the roots. Though our soils, in the main, may have all the ingredients deemed essential to fruit growing, yet they may not be progressed enough as primates from the original rocks, nor old enough in fertilization, to warrant general success. In certain chemical relations and proportions, water, carbonic acid, ammonia and inorganic matters are the food of plants; for vigorous thrift and complete maturity these must be supplied to act simultaneously and in progressed constituency. As a man will die, if only a single condition of his existence, air or water, for instance, is

withdrawn, so the perfect development of a plant is obstructed, if, indeed its death does not ensue, when one of its means of nourishment fails. It illy becomes us, then, to wonder at failures, and give up the undertaking; our business is to understand our business, and know how to feed our plants with what they naturally need to live, grow and bear fruit.

Allow me here a condensed statement from the experimental researches of eminent chemists. They demonstrate that compound substances exist that are chemically alike, but differ in appearance, and differ in all their effects in use. Parian Marble, for instance, and common chalk are called carbonate of lime; they are chemically alike, but unlike in effects. Professor Tyndal says, speaking of the minute shells composing chalk-beds: "These shells are built up of little crystals of calc-spar, and to form these crystals the structural force had to deal with the intangible molecules of carbonate of lime." During all these transitions it was carbonate of lime. And there he rests it as he must. Neither he nor his peers can tell us what vital conditions ensued, when "the intangible molecules" climbed into calc-spar, and this into shells, and these into chalk beds. No chemist on earth has been able to trace the vital processes by which nature fits her soils, and waters, and atmospheres for organic forms in regular gradations. Suppose a farmer sows a pulverised quantity of "the intangible molecules of the carbonate of lime" direct from the rock, and an equal quantity of the crumbled stuff from chalk beds; the former will be inefficient compared with the latter. Let him sow sulphate of lime which is known as Plaster of Paris—a valuable article rightly applied—and an equal weight of sulphate of lime made from bones by treating them with sulphuric acid to render them super-phosphate of lime; for a higher class of plants to which it is best adapted, the latter is a very large per cent. ahead of the former. The great difference in the effects of vegetable growth is not owing to the acid treatment above. Take the dust of phosphate rock which is composed of phosphoric acid and lime, and have the same relative proportions as in the phosphate from the bone, and treat it (that of the rock) with sulphuric acid, and, as before, the bone in comparison leads in nutritive virtue. Our farmers do or ought to know about these facts, yet they, generally, seem perfectly indifferent when they see buffalo bones by the car-load gleaned from the wild prairies and valleys, shipped into the eastern cities, thus robbing our soil of the best possible dressing almost at our doors. Why, the strange antics of a cow ought to waken the farmer to his senses, when she gnaws bones like a dog. She thus teaches him that his soil and thence his crops are deficient in available phosphate of lime. Will he give her the decoction of a powdered phosphate rock, or a bit of bone dust—which? We have a plentiful supply of potash, but, perhaps non-adaptable. If direct from the granite or field par, what is it fit for, except to be ground over and over by the plow and harrow, chrystalized and rechrystalized, pulverized and triturated, and possibly it may then aid in the growing of cereals, preparing the way for fruit plants. Suppose we try, even on the alkali fields, the progressed potashy of wood or grass; that's an improvement; that loves the apple tree and the apple tree courts the favor.

The night soil will produce effects such as are not warranted by its analysis, and such as cannot be imitated by any synthetical arrangement of similar constituents. Experience also demonstrates the other manures of a high class furnish progressed materials that will produce larger and better crops than even greater quantities of like primaries from a lower class.

The same rules obtain in *materia medica*. Prof. Mapes, whose horticultural writings are above all price, calls our attention to an interesting fact practically illustrative of the law under consideration. He says, "For more than a century a medicine has been manufactured in London, known as *Pulvis Jacobi* (James' Powders). For a long time its composition was a secret. The medicine, however, was in general use, and large quantities were annually sent to the East Indies by the East India Company, for the use of its medical department. It was very effective in the treatment of fever, and its action always found to be uniform. The Messrs. James, the original discoverers of this medicine died, and their successors of the same name, from philanthropic motives, made known the composition, and the receipt for its manufacture found its way into the *Pharmacopia*. It was said to be composed of phosphate of lime and oxyd of antimony in certain relative proportions, which were stated. James' Powders were soon manufactured by every apothecary as well as by the immediate successors of the original discoverers. The East India Company advertised for proposals to furnish them with medicines, among which was a large quantity of James' Powders, and a large and respectable manufacturer of London named a lower price for this article than that named by the Messrs. James themselves. It was furnished and sent out. The Medical department reported that it failed entirely to prove the usual results. The company refused to pay the bill, and a suit ensued. Many of the first chemists of England, including one of the Messrs. James, made an analysis of this article, and gave evidence that it was the same composition as that made by the Messrs. James.

It appeared in evidence that the new manufacturers had calcined the phosphate of lime rock from Estramadura, and then combined it with antimony as directed; that the Messrs. James made their medicine by calcining the bones of oxen, and mixing the phosphate so obtained with oxyd of antimony. Every chemist, Mr. James included, believed and stated that there could be no difference in the effect of these two medicines; that after the Estramadura rock was calcined, and the bone was calcined, the results were alike, and the verdict was given in favor of the manufacturers. The company, however, sent out a new quantity manufactured by the Messrs. James, and unlike that made from the Estramadura rock, it was found to be efficient."

This statement of Prof. Mapes clearly shows that men, like plants, can only assimilate such primaries in progressed conditions as are adaptable to their plans of being. It also helps us as to proper mixture and selection of manures; the higher qualities always for the higher grades of plants. Why will the cauliflowers refuse to be sustained in the proper soil for the lichens and mosses? Obviously because the cauliflower is far removed in progression of primaries in its structure from that of the lichens and mosses. The fresh debris from the mountain side may grow the wild, colorless, single rose, but try the progressed rose, a variety which only centuries of culture can develop, so beautiful and sweet, grim death is transformed in its presence into life's opportunity for a higher type of being; rather than be sustained there, its very soul departs, for ought we know, into the angel realm that enshrines all the perfections of nature.

The apple is the best fruit in the world, "the survival of the fittest," the companion of civilization. It was, doubtless, the crowning excellence previous to the records of the Greeks and Romans, previous to the pre-historic lake dwellers of

Switzerland, previous to the migrations of the early Argus. By the slow and unerring law of evolution, through centuries of transplanting, hybridation and fertilizing culture, it has reached its present perfectable condition. Hence, it must have a location, a soil, an atmosphere exactly fitted to its progressed structure and instincts. In the attempt to shelter the apple tree, suppose you plant it in the woods to feed on decayed leaves, locusts and wild honey. What a shriveled, scrubby, lousey thing it is! If it has health enough, bring it forth into the freer light and air, into cottonwood soil where you can love it into life, and see how quick it undergoes a "revival of religion."

Prof. Budd, of the Agricultural College at Ames, Iowa, in his able report on "North of Europe Fruits, Trees and Shrubs," calls our attention to the wonderful success of orcharding in nearly all the provinces of Russia. Speaking of the province of Kazan on the upper waters of the Volga, whose southern boundary is on the 55th parallel of north latitude, he says: "The largest and best orchards are on the lowest bluffs on the west banks of the Volga, or on the dry prairies just back of these bluffs. We found the dwarf-appearing trees loaded with high colored and really good fruit, and we could see scarce a trace of injury by the terrible winters of this latitude." He also informs us that the thermometer there, has often been known to reach fifty-eight degrees below zero. In other provinces of the hyperborean climates of the great empire are found vast orchards of cherries, as well as apples, and pears of the improved varieties. He and his horticultural compatriots were sanguine that root grafts or top-grafts from those hardy Russian sorts would be a pre-eminent success on our western prairies, dating their conclusion on similar dryness of air and rigor of climate, with the odds in our favor, because our soil counterparts that of the Russian plains, with greater natural richness in the main. But the test thus far largely disappoints expectations. While some Russian varieties have proved successful, it is found they are no more so than some of our native productions. We are therefore thrown back again upon our own resources to build our hopes where we must—on primary fitness to insure mastery for the apple and other fruits, over heat and cold, wind and storm.

Russia is an old country. Vegetations, animals, humanities have there lived and died, their bodies rotting and elementally rising again in improved forms; the primates of structure evolutionally progressed. Hence, apples, pears, plums, cherries, apricots are profitably raised there in localities much higher than our own, some of these flourishing where the Sirrocco of the north freezes the ground six, eight, ten, twelve feet. Our prairie soil is new in use; some of it just subduing by the plow. Give us a tenth of the time Russia has had to prepare for such fruits, give us but twenty years more, with closer analysis of soils, with improved fertilizers, with an education working from the school, to the field, and factory, with our forests then grown into paternal protection, with freer brains to think and sweeter hearts to feel, and see if we do not make our prairie lands the fruit Eden of the western continent.

The meeting adjourned till 2 o'clock P. M.

AFTERNOON SESSION.

WEDNESDAY, JANUARY 20, 1886.

The meeting was called to order at 2 o'clock p. m., by President Smith.

The *ad interim*, or District Reports of the Vice-Presidents being in order, the following reports were presented:

REPORT FROM FIRST DISTRICT.

WILD OR NATIVE FRUITS.

By A. W. Sias, Rochester.

Mr. President:

You will not be surprised when I say that about thirty years ago, nearly all the land in my district was in just that wild state in which the Aborigines had always kept it—abounding in a profusion of wild fruits, of no trifling importance to the pioneer settlers. And thirty short years is too quickly passed for the horticulturists of one district to think of running ahead of “Old Dame Nature,” were it possible to give the real value of the wild fruits of this district, (to the settlers,) in dollars and cents. And also in the value of all the cultivated sorts, it would no doubt astonish you to note the balance that would stand in favor of the wildings.

No inconsiderable number of our citizens predicted last spring, that all nature had turned a sort of “winter set” and somehow during the icy operation had managed to kill all the cultivated trees, and also the fruit buds on the wild varieties.

Happily, this proved a great mistake, as subsequent events most clearly demonstrated. The severe, cold winter (perhaps the most severe, since the settlement of the country) was followed by a cool, but seasonable spring and summer, and the result was that we reap one of the best crops of wild fruits known here for several years. This would indicate that “Dame Nature” understands her business, and is more lavish in her gifts than the majority of people are aware of.

The wild plum crop was immense—and many fine varieties among them. Some day we hope to produce from the seed, a native plum that shall astonish the horticultural world. Some of the best named sorts are, De Soto, Rollingstone, Cotterell, Waldron, Weaver, Wild Rose, and Forest Garden. James Berry, Choke Berry, Black Cherry, Red Wing, Black Haw, all bore plentiful crops. Wild Strawberry crop splendid, also Gooseberry, Currants, etc. High-bush Cranberry and Elderberries abundant. The Blueberry is found here, but only to a limited extent.

APPLES.

Some member of this Society remarked a few years ago that “a tree is known by its fruit” and not by the color of its heart-wood. And now it looks as though we might advance a step farther, and say neither is it clearly known by the color of its sap wood; for I can assure you that we produced thousands of bushels of as fine apples as were ever set before a king last year on trees whose wood was badly discolored from pith to bark. The recuperative power of our fruit trees, has taken

us all by surprise. Many orchards in this district bore heavily; prices ruled lower than ever before, and yet were high in proportion to other farm products. Among the common apples the Russians take the lead as to hardiness, many of the hybrids stand all right, and a very few of our seedling are looking as well.

As far as I know, no pears were grown the past season.

Plums, splendid crop; cherries, poor crop; grapes, fine crop; leading varieties grown, Concord, Worden, Janesville, Delaware and Rogers Seedlings.

BLACKBERRIES.

We believe the question of blackberry culture is now settled for all future time, and in the same way as that of the strawberry culture. No one expects to grow the strawberry in paying quantities for market without covering the plants in the fall, and the blackberry must be treated in the same way. Keep this constantly in mind and practice, and the delicious blackberry will very soon be as plentiful in our markets as the strawberry. Best varieties of the blackberry, as far as we know, are: Ancient Briton, Snyder, Hoag's Seedling and the Mammoth Dewberry.

STRAWBERRIES.

The strawberry crop is very fine, and prices good, our gardeners are encouraged and will enlarge their beds in the spring.

The irrepressible Crescent Seedling still leads the van. It not only "chokes out grass," but chokes off all new aspirants for unearned honors, keeping the while just a step in advance. Downer's Prolific is still popular, Sharpless the largest, and Cumberland Triumph hard to beat for quality and beauty of proportions. Among the newer sorts the Old Iron-clad, Manchester, Vick and others, are attracting considerable attention.

RASPBERRIES.

Crop splendid. Turner the leading variety, Cuthbert, Brandywine, Sheffer's Colossal, and several others grown to some extent; Marlboro, not fairly tested, but quite promising.

REPORT FROM SECOND DISTRICT.

By VICE-PRESIDENT E. H. S. DARTT, Owatonna.

Mr. President and Members:—

I have been watching with far more than ordinary interest the advent and effects of the exceptionally cold winters of the last few years. And though they have seemed uncomfortably close together and decidedly discouraging in their effects, we have to admit that last winter 1884-85 *beats them all*.

Previous to that our common apple trees such as Fameuse, St. Lawrence, Talman Sweet, Haas, etc., also Wealthy and other Minnesota seedling apples, had been gradually but surely freezing out. Now a clean sweep has been made. The Duchess and possibly a few other Russians which may prove of equal hardiness and the despised crab apples, with crosses between the two are all that is left on which to build our hopes for the future. And since the Russians are not all hardy and many are liable to blight, (and the same is true of crab apples) we can readily see that years of experience will be required before our Society can put forth a list or lists that shall prove reliable for all sections of the State.

The Duchess has stood best in high, airy locations, and on northern slopes, whilst in low, sheltered situations it has killed out badly. The Tetofsky seemed as hardy as Duchess till last winter. Now three-fourths of them are dead. The most live trees are found where the land has been the best cultivated, and the most manure has been applied.

Of crab apples I have tried about forty named varieties, besides a large number of seedlings of my own production, and up to the present time I know of hardly a tree that comes up to all the following requirements: hardiness, fruitfulness, size and quality of fruit, longevity and freedom from blight. I think about one-half lack in hardiness and an equal proportion in fruitfulness, and blight hits them all to a greater or less extent, some much more than others. I mention a few varieties:

Transcendent—Liable to blight; supplies our own market nearly every season.

Hyslop—Not a good bearer, sometimes blights; apples second quality; keeps well.

Greenwood and Early Strawberry—Well up on most points; apples do not keep.

Whitney No. 20—Promising; have grown it 8 to 10 years; needs further trial.

Dartt's Hybrid; same.

Maidens Blush—Sprouts badly from bottom; dies young.

Minnesota—Not productive; short lived on sandy land.

Orange—has not borne well; blossoms very frail; killed by slight frost.

Gen. Grant, Conical and Marengo Winter—Not hardy; blight to death.

Beeches Sweet and Hutchinson's Sweet are well up except on fruitfulness.

I sincerely hope that our Society will in the near future pay more attention to the crab list. For the people want trees that will stay with them and produce a passible fruit in seasonable quantity. They are tired of kinds that come with deceptive, high-sounding names, go with winter's first shock, or linger for a season to prove how uncertain certain things are, and especially Minnesota apple trees.

REPORT FROM THIRD DISTRICT.

By VICE-PRESIDENT M. CUTLER, Sumter.

Mr. President, Ladies and Gentlemen:

Owing to my not receiving last years' report of the Society until late in the season, and my being busily engaged in building, I was not aware of the duties devolving upon me as vice-president until a few weeks since, after having accepted an invitation from our Secretary to contribute a paper for this meeting. Hence my report will not be as complete as it would otherwise have been.

The past year has been one to test the courage of the horticulturists of the Northwest. From every direction come reports of the sad havoc produced among fruit trees and plants. My section of the State has suffered with the rest. All report their standard trees as dead or dying.

Contrary to expectation Transcendent and Hyslop trees came out in pretty good shape last spring, blossomed very full, and bore a large crop. There were so many crab apples in the market that they reached the low price of twenty-five cents a bushel. A few Duchess apples were in the market but no other home grown standard apples. Wild plums were abundant.

One year ago last fall I had as fine a strawberry bed as I ever saw, about one and one-half acres, located on the west side of willow trees. I covered them nicely with marsh hay and hoped for a good crop. But alas my fond hopes were doomed to disappointment, the snow blew off the highest part of the bed, and where it sloped to the Southwest the ground thawed out to the depth of four or five inches during the first days of March, then froze up solid so that most of the plants were killed. Where the slope was to the Northwest and on the low land, Crescents and Glendales were in fair condition, but Old Iron-clad, Bidwell and Pipers were nearly extinct. Manchester, James Vick and Jumbo were about half killed. Manchester and Jumbo produced some large berries, and James Vick a few small ones.

Crescents proved as usual with us, the boss of all, for wherever a plant had life enough to live, we found nice berries whether in weeds four feet high, or where the ground was clean. Some have said they were too soft for a market berry, I shipped them to Fargo and Aberdeen, Dak., and although some were dead ripe when picked, they were reported to be in fine condition, and were sold at good prices.

I copy the following from *Rural New Yorker*, from a Michigan correspondent. "Sharpless sold in the Chicago market for \$1.75 to \$2.75 per 16 qt. case; Crescents 90 cts. to \$1.75, while Wilsons sold for 25 to 40 cts. Total expense of picking, crates, etc., 45 cents per case." You can easily figure out which paid a profit. The same writer states that the Crescents yielded much the largest crop.

I gathered 2,300 quarts, 500 being from my old bed, which sold for 12½ cts. per quart. The crop would have been better but for drought and hot weather in June, which nearly cooked vines and berries. As far as I have been able to learn, berries grown on the east side of trees where covered with snow, came out in good condition.

Turner raspberries came out all right and bore a good crop. Cuthbert in fair condition for newly set plants. I have come to the conclusion that to get a crop of blackberries they must be covered, and that those most productive and of the best quality should be set.

Grapes do fairly well where properly cared for, but on account of frost none but the earliest kinds should be set on the prairie. One of our members, Mr. Nobles, had some very fine Concord grapes which he exhibited at our County fair.

The display of fruits and vegetables at our County fair was not very extensive, not because they are not grown, but because horse-racing and gambling games are made such a prominent feature that few respectable farmers will exhibit their products. When they see fifty cents offered for the best plate of grapes, and \$100 offered to the owner of the fastest trotting horse, their exhibition ardor gets so cold that it never thaws out. When the people see their hard earned dollars spent in fixing up costly race tracks, great amphitheaters, and elegant barns for the accommodation of a few horse jockeys and gamblers, and the great agricultural staples of the State shoved off into a temporary shed, it is time to cry a halt. We have often been told that a fair could not succeed without horse-racing, but the Dakota County farmers have proved the contrary, and I hope other fair associations will follow their example. Mr. Ditus Day, of Farmington, writes me as follows: "We had no racing at our fair last fall, and all that I have spoken to admit that it was the best fair we ever held, and we had plenty of money to pay premiums, for the fast horses did not carry it all off, as has been the case sometimes before."

In regard to fruits Mr. Day writes as follows: "Strawberries were a good crop; Crescents did the best, and Green's Prolific did well. Delaware, Concord and Janesville grapes did well." He likes the Delaware the best of all.

The Turner raspberry stands the winter first rate and bears a good crop. Berries brought 10 to 15 cts. in our market, and grapes 8 to 15 cts. per lb.

Duchess apple trees were but little injured last winter, and bore a good crop.

I append the following report from Mr. Crandall, one of our leading fruit growers.

FRUIT REPORT FROM McLEOD COUNTY.

M. Cutler, Vice-President Minnesota Horticultural Society.

DEAR SIR:—In answer to your inquiries after fruit culture I give the following:

(1.) "Give age and description of seedling apple, comparing leaf and body of tree with other apple trees, also condition last Spring."

Ans. I have some fifteen or twenty Duchess seedlings five years old of which one is a promising, thrifty tree but has not blossomed yet. It is tall and straight, and if the fruit should prove good, would make good nursery stock. The leaf resembles the Duchess very much, with perhaps a little resemblance to the Transcendental. Some of these seedlings are of very slow growth. Others have been set back by the green aphid, but have done better this season than ever before and may become thrifty. None of these Duchess seedlings have ever winter-killed, not even affected by last winter's extremes. Seedlings from Russets and Willowtwigs froze down every winter as long as their roots lived.

Last year all of my standard apples black-hearted or killed out entirely except Duchess. The Crabs came through in fair condition, except some young Transcendents, which black-hearted. Whitney No. 20, Early Strawberry, and Hyslop showed no signs of black-heart.

(2.) "How many kinds of strawberries have you, and what was their condition last spring? Which stood the drought and yielded the best?"

Ans. Over twenty kinds, besides seedlings. All were covered last winter with marsh hay as usual. Great American, Mount Vernon, Bidwell, Old Iron-clad, and Glendale, a part of Crescents, Sharpless and Cinderilla, were protected by snow through the March thawing and freezing, and were in good condition in the spring; those not protected by snow except seedlings and Parks Beauty were from one-fifth to four-fifths killed by freezing and thawing.

Considering the quantity of ground occupied, and the lack of mulching to keep the soil moist, I think the Parks Beauty stood the drought and the winter the best and bore the heaviest crop. I think the Parks Beauty is not the same as Crescent, but it is very much like it with renewed life and vigor.

Pipers Seedling and Kentucky stood the winter as well as the Crescent, and better than Captain Jack, Wilson, Warren, Big Bob, Cinderilla, Longfellow, and some twenty other kinds.

(3.) "What can you say about your seedling strawberries?"

Ans. They were not protected by snow and were not winter-killed. About a dozen from Crescent and Sharpless, Crescent and Capt. Jack, and Sharpless and Capt. Jack produced the finest berries on my place. There were more pistillates than perfect blossoms and generally the pistillates were larger than the hermaphro.

dites, but not quite as fine flavor. The plants were nearly all strong growers with thick, heavy foliage resembling the Sharpless while the berries had the peculiar yellow seeds of the Captain Jack. I can't give a particular description of any one as my memorandum has been mislaid. I have a large number to come into bearing next summer that did not fruit this year. Not one of the large number of seedlings from the Great American bore any resemblance to their parents. One seedling from the Cinderilla was of fair size and flavor, but in neither quality equal to the parent stock.

(4.) "What do you consider the best raspberries for prairie cultivation; give experience?"

Ans. After six years experience I find Turners red decidedly the best on the prairies. Philadelphia winter-kills more, is softer, smaller and less productive. Brandywine is hardy, but is small and yields but little. I have not tested any good Black-caps yet. Purple-cane and its seedlings are hardy but too small. Gregg freezes down every fall. I am now trying Tyler and another Blackcap: have some hope of them.

(5.) "What kinds of grapes do the best with you?"

Ans. As yet the Salem; but the Worden, Moore's Early, Concord and Brighton may do as well after a full trial. Clinton does not pay for the trouble of covering it in winter. Worden is sweeter and thinner skinned than Salem, and Brighton is a ranker grower. Salem is the best of these and the best keeper. It has always ripened here except in 1884, when we had practically nine months winter, and nothing got ripe that season.

(6.) "What can you say about blackberries?"

Ans. I have had no success with them yet. They all freeze down to snow line. Snyder and Taylor's are not worth bothering with any more. Will try two other kinds that I have and one or two kinds of Dewberries, and perhaps some seedlings.

Yours with respect,

E. CRANDALL.

Sumter, Minn., Dec. 1885.

REPORT FROM FOURTH DISTRICT.

By VICE-PRESIDENT, F. G. GOULD, Excelsior.

The experiments of the early settlers of Minnesota in growing fruit resulted usually in utter failure. The day of small fruits had not yet fully arrived, and it came to be a common saying that fruit could not be grown in Minnesota. This supposed fact was considered the greatest drawback to the settlement. While the healthfulness of the climate, and productiveness of the soil were satisfactory, it would do to endure but was not good enough to live in.

About twenty years ago the Duchess apple and Transcendent crab came into notice and soon after the Wealthy apple. About this time the Delaware and Concord grapes began to attract attention all over the country, and we may as well make the year 1866 or thereabouts the date from which we started on a more hopeful prospect in fruit growing. To be sure a few fine strawberries had been grown, a few grapes had been tried. Those of the latter, of most value, were the Isabella

and Catawaba, both late in ripening but answered the purpose of demonstrating the possibilities of grape culture.

All will admit that the orchard and fruit garden add much to the enjoyment of farm life, especially with the children. How many of us have in dreams in later years lived over again the scenes of our childhood and the happiest of all were, those when we were the first in the orchard in the early morning to gather the first fruits which had fallen during the night.

I could not advise the planting of extensive orchards of the apple, but I would recommend the planting of a few trees of the apple or crabs on every farm, even without a fair prospect of making a profit out of them. I believe this to be the duty of every owner of a farm. Children relish the Transcendent crab; it is the best medicine for them, and another thing, when boys have fruits at home they will escape somewhat of the temptation to appropriate that which belongs to others.

A larger list of desirable fruits can be grown in Minnesota and Dakota than in the extreme Southern states of the Union. My attention was called to this fact last winter at New Orleans by residents of that section. To be sure they have there oranges, figs and cherries, and that about completes the list, except the shell fruits.

Wild strawberries and red raspberries were quite plentiful last season in the vicinity of Turtle mountain and Lake Minnewaken in Northern Dakota.

Chokecherries of the best quality I ever tasted grow in the greatest abundance in the so-called "bad lands," in Dakota.

Strawberries and raspberries are among the most valuable of fruits. Currants, gooseberries and the native plums are desirable also. They can all be successfully grown all over Minnesota and Dakota.

The grape can be profitably grown only in favored localities but in such locations where good varieties have been planted and properly cared for they have returned a greater profit than any other crop grown.

The timbered portions of the Northwest are the most congenial to nearly all kinds of fruit. Some kinds succeed best on northerly slopes; among these I will name apples, raspberries, strawberries and blackberries. The selection of varieties is the most important step in the business. Unlike most other things the higher priced are generally of the least value to the planter. At present there are many new and untried kinds of fruit plants offered to the public; possibly some of them may have some merit, but I would suggest touching these new things lightly, for if they prove worthy they can be secured later at a moderate price.

I will name some of the varieties of the different fruits which I consider the most desirable for planting over the greatest range of country. Of the apple family I will name the Transcendent crab. This sort can be depended upon to yield more fruit than any of its kind.

The Turner raspberry is the hardest of all known sorts. Where it will not succeed, I doubt if it is much use to try any other. The quality of the fruit is as good as the best. If it was as prolific as the Philadelphia (which exceeds all others in this particular) it would stand very much above all others.

The Wilson Strawberry is the best for general cultivation though it does not always do well on sandy or light soils. It requires care in the growing season and protection over winter.

Among the blackcaps I will name the Doolittle and Seneca. None of the blacks

can be relied upon on the prairies west of us. Currants, the Red Dutch; gooseberries, Houghton; grapes, the Concord and Delaware with a very promising candidate in the Moore's Early. I think the Snyder and Ancient Briton blackberry are giving as good satisfaction as any at present, but are liable to winter-kill unless protected by laying down.

The cultivation of the apple is an up-hill business, as the hardiest known trees are either killed outright or severely crippled as often as once in every ten or twelve years. The question as to what killed the trees has been pretty thoroughly gone over. The fact that the most disastrous years were those when the mercury found a resting place down in the forties has convinced me that the extreme cold weather has much to do with it.

Mr. Gould. Mr. President, I have to report, in common with others, injury to nearly all kinds of apple trees by the severe winter of last year. Some varieties, the Duchess and others, had life enough to blossom more or less; some of them set some fruit, but nothing to amount to anything, excepting the Duchess and Wealthy, of the large apples. It is the case quite generally in our neighborhood, and I don't know of any place where trees have shown more injury any year since the winter of 1874 and 1875 than last year.

Generally, good crops of strawberries have been raised. We have found the snow a good protection. In the timber districts the Philadelphia raspberry bore a good crop generally. On the prairie, in some places, it was killed quite badly. I think the Philadelphia will bear more berries than any other known sort in the Northwest; it will bear a good many more where it will stand the winters. The Turner is hardier, however, so far as my observation goes; I think it is the hardiest raspberry we have. None of the blackcaps are as hardy as the Philadelphia, and not near as hardy as the Turner. An ordinary winter will kill the blackcaps on the prairies most anywhere, more or less, and I consider the blackcaps utterly worthless beyond the Big Woods west of here, unless they are covered. The price of strawberries was lower last year than it has been for six or seven years, I think.

A Member. What was the average price?

Mr. Gould. Well, I think the price did not average eight cents a quart last year. I have been growing for the market, more or less—not in very large quantities, however—for fifteen or sixteen years. Year before last I estimated my crop at an average of about ten cents a quart; it might have been as low as eight; but I am satisfied that last year the price was lower than ever before.

Col. Stevens. I understood Mr. Pearce's crop averaged twelve cents.

Mr. Gould. I presume he is a better salesman than I am.

Col. Stevens. Can you raise strawberries at eight cents with any reasonable profit?

Mr. Gould. Oh, yes; that is better business than growing wheat, a good deal. They can be grown profitably at from five to six cents per quart; two cents on a quart is a pretty good profit. I am speaking, of course, of the wholesale price.

Plums were plentiful in this part of the State, so much so that everybody could have a share even if they had but little money to buy, and a good many could have them without money.

Currants and gooseberries were, perhaps, not a big crop, but there was a fair crop of currants. Gooseberries are not raised here very extensively, but the Houghton, as far as I noticed, were a fair crop.

REPORT FROM FIFTH DISTRICT.

By VICE PRESIDENT G. W. FULLER, Litchfield.

Mr. President :

I have no written report, and I will be very brief. I am sixty-eight miles west of this city, on the St. Paul & Manitoba road, five miles beyond the Big Woods, on the prairie. We had a year ago quite a fine crop of Wealthy and Duchess apples. This last year the only apples we had, to amount to anything, were the Transcendents. The Wealthy trees, not only my own orchard, but as far as I know all through that section of country, with very few exceptions, were killed. I have a few very poor trees still surviving. The Transcendents, however, done the best the past year they have done for years, and have produced a fine crop. Hyslops were a failure. I had a pretty good crop of Early Strawberry. The trees are in fair condition.

Our currant crop was very fair; mine was as good, probably, as I ever had. I have the white and red varieties. I do not think there is any better variety for our section than the Victor.

Of raspberries, of course the Turner is the best with us. I have the Philadelphia, but shall allow them to run out. The Cuthberts I set a year ago last spring, but the bushes were killed down last spring. I don't regard them worth raising,—that is, unless we can succeed by covering.

Blackberries, as I have already stated, are of no value with us unless covered. We raise the Doolittle blackcaps there, getting a very good crop of berries from the new shoots that come up in the spring. I

keep all my raspberry bushes down low by pinching them off when they get up two or two and a half feet; I pinch them back and keep them low in that shape.

Strawberries were very good the past year. I raised the Crescent and Charles Downing. The Glendale I do not regard as worth raising. I have had them, and they do very well to fill up a quart box, but are good for nothing else with me. The Sharpless failed by reason of frost in the early spring. The year previous, however, I had a very fine crop.

As to grapes, I would report that I have the Janesville; have not given it a long enough trial to say what it is really going to do; I doubt about its being successful. I have several other varieties. The crop, was very good, and I sold none of mine for less than fifteen cents a quart; that is the wholesale price. The retail price during the whole season nearly was twenty cents. Of course, we don't send them down to Minneapolis; we sell them at our own place and send them west.

The Cherry currant I have never raised successfully. I have had them for ten years, and every year it would die down. I regard it as entirely worthless in our locality.

Mr. Kellogg. We have about ten papers that want about ten hours' discussion. We left off this morning and promised to take up, first, the unfinished question about grafts, about their treatment and growth, how farmers could use them, and the profit that could be made from root grafting, etc. We have had presented the subjects of hot and cold locations for trees and plants, seedlings, new plants, propagation of small fruits, fungi, wild fruits, Russian fruits, and grapes in all their varieties; raspberries, blackberries and strawberries, in all their varieties; two varieties of dew-plants; winter-protection, cross-breeding, tree culture as adapted to northwestern prairies, and lastly, that never-ending question of blight. [Laughter.] I don't see any hope of touching them all.

The report of the committee on Russian apples being called for, Mr. Cutler in presenting the report stated that owing to the limited time the committee had had to inquire as to the merits of the different kinds of Russian apples, and their non-acquaintance with the quality of many of them, they had deemed it best to select only such as have been grown in Minnesota, those that are of good enough quality to pay for growing; that the committee had to take the evidence of their own number to some extent, that had propagated these different kinds of apples.

RUSSIAN APPLES RECOMMENDED.

We the undersigned committee appointed to report six Russian apples for general cultivation report the following:

Ostrekoﬀ's Glass, No. 472.

Hibernal, No. 378.

Red-checked apple, No. 445.

Red Anise, No. 985.

White Pigeon, No. 317.

Autumn Streaked, No. 964.

Respectfully submitted,

ANDREW PETERSON,
M. J. HOAG,
M. CUTLER.

Mr. Smith. I move that the varieties named be recommended for trial rather than for general cultivation.

Mr. Tuttle. Mr. President, I think that is a proper thing to do with all these Russians, for some time, at least. We will find probably a good many just as valuable and some a good deal more valuable than those on the list.

Mr. Sias. I am in favor of the motion. I would ask Mr. Cutler and other members of the committee if they are willing to accept that amendment.

Mr. Cutler. Yes, sir; I have no objection. I think that is best.

The motion was carried by sixteen in favor and none against.

DISCUSSION.

Mr. Kellogg. We stopped in the discussion of root grafts, after we had got them planted, I believe. Upon that subject I want to say that if it is designed for the farmer's use, I believe it to be the most profitable way you can grow an orchard, to set out the trees when not more than seven inches long; set with a stake on the south side. If you take half as much care in growing your orchard as you do your calves you will have apples, and plenty of them. The tree should never be transplanted from the place where it is first set. After setting there should be clean culture until the first of July, then let the ground go to grass. I don't want any late cultivation, either in a nursery or in the orchard. It is better to put two grafts in a hill so as to be able to take one up if necessary; if one dies you have a chance for another. Give them clean culture, and keep everything out except the horse that draws the cultivator. Let your graft occupy the place of a hill of corn.

Mr. Sias. About twenty years ago I advocated that same doctrine. I went to selling root grafts, and I only found one man that succeeded with them. He is not a nurseryman, and never has been, but is one of the best practical gardeners I ever knew. He watched them, took care of them, and from those root grafts he had a splendid orchard. He had eastern varieties from Rochester, N. Y. And he was the only man I ever knew that succeeded. Farmers, as a rule, will not take care of plants; they neglect them when they are small. They only have to neglect them for a single year in order to have them die. If we could "make over" the farmers then it would be all right; but it seems to me, as we have to take things as they are, that it is better for the nurserymen to nurse the plants until they get to be three or four years old. The farmers have succeeded with that class of trees the best.

Mr. Tuttle. I have seen both methods practiced, and I can't see any difference—not a particle. As to cultivating, we used to think, a few years ago, that we must cultivate the fore part of the season, and then leave the trees growing in the grass. That was when we didn't grow Russians. We can cultivate the Russian apple; I find no difficulty, neither in the yearlings nor in the others. There is no trouble with the Russian apples from late cultivation.

I have never had any trouble from root-killing in the orchard; if I did, I would mulch the trees. The trees that were mulched on sandy land in 1872 and 1873 came through all right. If I was setting an orchard on sand I would mulch the trees in the fall, always throwing dirt around them. Your trees would always be secure in the sand; hard soil freezes much deeper and harder than lighter and more porous soil, especially if you get on gravel. Freezing will kill anything. Any kind of mulching will prevent excessive freezing. I have examined orchards where nearly every tree was killed,—an orchard set thirty-five years ago, and on quite sandy land. The trees had gotten to be of considerable size, and finally nearly all of them died, and sprouts were coming from the roots.

It has been a pet theory that we must take the crab in order to get good roots; but we have found that the crab is not fit to graft a common apple on to, either in the top or root. I would like to use crab grafts if they were of any value. I had but very few apples last fall, I ground up some of my crab apples for cider, and piled up the pomace. I should very much have liked to wash out the seeds for planting, but I had tried it and knew it to be worse than worthless.

A Member. Couldn't you use the seeds of the Transcendent for root grafts?

Mr. Tuttle. No; I could have washed out \$20 worth of seeds in a day, but I have seen enough to satisfy me that it is the worst thing we can get.

Mr. Smith. I have seen Transcendent roots used, and I never could see any difference between them and others, when the trees were dug up two or three years afterwards. I could see nothing in the growth of the trees for two or three years that militated against them.

Mr. Tuttle. Well, the difference comes after that. I have seen trees set of the Duchess and Fameuse, grafted on crab stock. Those trees were perfectly worthless as orchard trees; they were scraggy and of no account. It don't make any difference whether you graft in the top or the bottom. I have grafted on the common crab, on the old Transcendent, on the large, the yellow, and the common, and have never found a tree yet that was worth anything as an apple tree, grown upon crab stock. I grafted ten thousand Tetofsky on Transcendent crabs, and those trees proved to be perfectly worthless. Of that ten thousand there isn't, I think, a stem alive in the Tetofsky above the ground—not one.

Mr. Cutler. I would like to ask what kind you consider the best?

Mr. Tuttle. I have been in the habit of recommending the Fameuse. I have been experimenting with a quantity of seedlings. Some of them I have great hopes of, but there isn't one of them that I would recommend for propagation to-day, because they haven't had trial enough. I have apples other than the Fameuse that appear to be No. 1 in hardness and quality, and yet I would not dare to recommend them. We have had apples which were recommended a few years ago in Wisconsin, which were said to be just what we wanted; men have gone and planted thousands of those trees; if those trees had stood and proved to be hardy, they would have made orchards that would to-day be worth thousands of dollars. I planted five hundred of them and don't consider them now worth anything. We don't dare to recommend these seedlings; it takes years of trial to fully test them. Understand me, I don't object to men planting seedlings; I don't care how many. I am planting lots of them myself, but I say it takes years to test them, and I don't expect to live long enough to see a seedling that is thoroughly tested in Wisconsin; and yet, I would not discourage anybody from planting them. There may be something that will come from it; we have been working for twenty years and we haven't got much of anything we can depend upon now. The seedlings of Mr. Gideon, crossed with the crab, undoubtedly are as valuable as anything

we have. I have seedlings crossed with the crab, sweet and sour, very nice ones, but still we can never make the crab apple take the place of the common apple as a market apple. You may raise all the crabs you wish, and no matter how good the quality, people will buy their apples from the Baldwins and Greenings.

Mr. Smith. Somebody said there wasn't any difference whether you planted root grafts or transplanted them when two or three years old. That is a question that is of importance to farmers, and I think there is a vast difference if grown by them; I think Mr. Kellogg's views are correct. A good root graft is worth in the market about one cent put up in good condition. Farmers throughout this State have been paying twenty-five cents up to a dollar apiece for trees that were not worth as much for them to plant as the root grafts would be. Many of them, if they knew how to plant root grafts would do it, their boys would do it, and I think it is very important for the best interests of farmers that this question should be thoroughly answered. Now, in regard to tying, the nicest thing to use is to unravel an old stocking leg and use the yarn. One end of the yarn is fastened at the top of the graft and then wound around. Mr. Sias says they will all die. They fail of course, from careless handling, and you have to handle them more carefully than you do eggs. If you break them apart after they have been knit together, they are very likely never to unite again. The ground should be worked at least two inches deeper than you expect to set the plants.

Another reason why farmers do not make a success with root grafts, is that nine times out of ten they take the plants out under a burning sun into a warm place and set them out; they may be exposed perhaps for two hours to a hot sun where the heat is so intense that perhaps ten minutes' exposure will turn them brown. If I were to advise how to handle grafts I would recommend to take them to the cellar, into the shade, or to the north side of the house, without allowing the sun to shine or the wind to blow on them; careful handling will insure success. I verily believe that to get an orchard cheaply and surely it would be better for a man to get these root grafts than to set three and four year old trees.

Mr. Pearce. I have no objection to the farmers setting out root grafts, but there is objection to setting them out in the orchard at once. If they will take the root grafts and set them out in rows and cultivate them, they will soon have them ready for transplanting, and will succeed in growing them. I can see no objections to farmers setting out root grafts if they will take care of them.

Mr. Sias. Fine spun theory is one thing, and practice another. I live at Rochester, about fifty miles from any large body of water, and I am satisfied that if I had set my orchard in the start that way, I should never have succeeded in keeping my trees alive. I am on a high, northern slope, which is naturally, I think, too dry for an orchard, and if I had set root grafts in there, (unless I had cultivated it right along every week as they do the root grafts), I am sure that I would have lost every tree in my orchard. Perhaps these root grafts may be set on the shore of some lake, and with half the cultivation that would be necessary in my locality, they might succeed, but to recommend the practice generally to farmers, to plant out trees in that way, would be decidedly wrong; why, I think I would insure more than two-thirds of them to die. It has been tried; it is no new thing, and has proven a perfect failure, as a general thing.

Mr. Busse. I don't think farmers should buy trees less than two years old at least. I have been out west and seen a good many orchards, of trees four or five feet in height. In times of haying and harvesting the grass was about as high as the trees. A great many plant them all right and say "I am going to have an orchard and take care of it," but the time comes when their work presses and they neglect the trees; the consequence is that if the trees live through the first year, they are sure to die the next. These root grafts will not grow if you don't take care of them; the farmer don't do it, and it is better not to recommend them. They should not have the trees before they are two years old, because if you give them grafts, they never will get an orchard at all; that is the opinion I have of it.

Mr. Cutler. I would like to ask Mr. Tuttle how long he would leave the trees in the nursery before transplanting?

Mr. Tuttle. That depends a good deal on the variety. Some trees will do first rate transplanted when they are five, six, or seven years old. I set out in rows three hundred Duchess trees, five or six years old and never lost a tree; there were three of them killed last winter. But there are other trees that it is better to set when they are two years old. We don't calculate to sell a great many two year olds, but in setting them we do it without trimming; we find that trimming is not good for them. It was practiced generally thirty years ago, but I don't know of a practical pomologist in Wisconsin that would recommend it to-day. I set out fourteen or fifteen Seek-no-furthers; four of them did not survive the first winter. They came from Rochester, N. Y., and according to the ideas I have always had,

I thought they were about worthless, and so they proved to be, for there are but two or three out of the lot left. I set out fifty Golden Russets; they came on and bore. I lost twelve of these trees in a storm, but they came up again from the ground.

Mr. Brimhall. I think it would be better to recommend to farmers to buy two year old trees.

President Smith. This question seems to have been pretty thoroughly discussed; it has had about an hour and a half.

Mr. Kellogg. Mr. Tuttle has sprung another question on us, as to the formation of trees, and the height of the top; that will take another hour's discussion; we shall never get back to where we started. But before leaving this question of root grafts, I will say that I think the very fact that farmers wont take care of them is no reason why it is not the best way to grow an orchard. There must be thorough cultivation, of course; it is only neglect that kills them, still they don't require any more attention than a farmer gives his calves. How long would a calf continue to grow if you didn't feed him night and morning?

Mr. Sias. One thing more. Farmers never set their trees deep enough, if they set them with a dibble. They ought to set them with a spade. I have been practicing setting with a spade the last two or three years, digging holes four feet deep and four feet wide, digging them in the fall, and find my trees have been doing better, by this plan of getting the roots lower down; if trees are set with a dibble the roots will be covered so shallow, right where they want to extend, they will dry up. The dirt should be stirred deeply.

Mr. Smith. I want to ask what good two year old trees, as they come from the nursery, are worth; what would be a fair price for them? I think nine-tenths of the farmers are paying three and four dollars a dozen when they would not take care of root grafts.

Mr. Sias. I have no objections to telling what I am selling my trees for. I sell any number under fifty of my best Russian varieties at twenty-five cents apiece.

Mr. Smith. Two years old?

Mr. Sias. From two to four years old; anything two years old or anything above that age; we have been selling for years at those prices. If they take fifty trees or upwards, the price is twenty cents. If they go much higher than that it is still lower.

Mr. Tuttle. In selling in small lots, of course the price would vary; some varieties are worth more than others; twenty or twenty-five cents is our price for trees when a man sends a small order.

Mr. Smith. That would be a fair price for two year old trees!

Mr. Tuttle. If a man gets a good tree, it is really cheap if it costs him half a dollar to a dollar; if he gets a tree that won't live, it is dear at any price. I can afford to grow Russian trees cheaper than I can natives, cheaper than I can grow the Wealthy, for the reason that a tree that will grow right along is worth more than a poor one and we can afford to pay more for it.

Mr. Smith. But as a general proposition if a man asks fifty cents apiece for his trees, you would set him down as a humbug, wouldn't you?

Mr. Tuttle. Yes, I would; and a man that buys his trees for five cents apiece and sells them for a dollar and a half is a thief. [Laughter and applause.]

People that set out these small trees don't realize and think at that time that the roots of those trees require a large amount of good soil in order to make them grow. A tree that will bear six barrels of apples must have plenty of room for its roots to extend. I have seen an orchard raised on what was called pine land in the East. The owner was told that he couldn't raise an orchard there; but he said he would have a good orchard by planting the seed. He had the ground prepared the same as you would to set an elm tree, taking a great deal of pains, and setting out a large orchard. The result was that some thirty years after that he raised hundreds of barrels of apples on that sandy land.

Now, in planting apples on our prairies we need to dig down at least two feet where the roots will have to extend; you then come to a hardpan; if you dig it out and set the trees they will grow; but you must know what the roots have got to feed upon and give them a chance.

One thing more. Setting trees in the fall of the year, apple-trees, elms or anything else, is usually a failure. We have had elms set in the fall, and three out of four died the next season. Why? Because the dirt that was put around the roots was loose, so much so that the frost came down and froze them and they became just as dry as if they were burned. If you set a tree in the fall of the year wet the roots thoroughly; if you keep them wet until the spring frost is out it will live; if you do not, it will certainly die.

Mr. Harris. Mr. President, Prof. A. B. Seymour is present, and has prepared a lecture upon Grape Rot, Pear Blight, Diseases of Strawberries, etc., and may not have time to give it in full this evening, as he desires to return to Madison by the evening train which leaves at 8

o'clock; therefore, I suggest that we call him forward to address the Society at this time.

The motion was carried.

Prof. Seymour then came forward with a number of charts, much enlarged, which were hung up in front in full view, and were used by the Professor in illustrating his remarks before the Society.

Prof. Seymour. I have nothing especially new to offer, and did not expect to give anything that should go into print, but at the request of your Secretary I have consented to give some points on the subjects of Fungus Diseases of Plants; and I would be pleased to receive any practical suggestions from you that we may be mutually benefited by the discussion.

STRAWBERRY DISEASES.

The subject of Strawberry Diseases has been treated by Mr. F. S. Earle and Prof. Wm. Trelease has also treated the subject very thoroughly. Mr. Earle has found ten species of fungi on strawberries. Five of these were species that had never been observed before. Of the ten he finds only about three are specially injurious. White Rust, (*Ramularia Tuslanei*) is especially destructive and is quite common all over this country, as well as in Europe, where it has been known for many years. Its first appearance on the leaf is seen in little red spots. As those grow older and larger, they become brown, or it may be white, and covered with threads that come through the leaf. This red color comes from a red fluid in the outer cells of the leaf. Mr. Earle finds it to be especially destructive to plants in the latter part of the season, and is more destructive then than at any other time, especially during the fruiting season and afterwards. In the fall the plants have sometimes been found to be so badly diseased as to be almost worthless. The heavy fruiting of the strawberry vines seems to have a good deal to do with the disease. It might seem at first that the fungi are caused by over-fruiting, but I do not think it can be properly said that over-fruiting is the cause of the disease. A man weakened by exposure is more susceptible to disease than if perfectly healthy, but if he takes the small pox or typhoid fever it is because he is perhaps more susceptible to the germs of the disease than another who is subject to the same exposure and does not contract the disease. If the germs are absent he will not contract the disease in any case. If they are present they will have a better chance to work in the weakened condition of the system. And with the strawberry, in the over-fruiting, the plant is exhausted, and if the fungus germ is present it is more

susceptible to injury by it than the vigorous plant; but in the absence of the fungus there is no disease.

Mr. Earle believes that the damage to southern plantations is greater than in more northern regions. (The structure of these fungi was here explained from the chart.)

The fungus grows within the strawberry leaf and sends out threads through the breathing pores on the under surface. The threads bear the germs or spores.

Whether the germs can live over winter or not is still a question. If not the fungus must be carried over winter in some other way. There is another form of this fungus that lives over winter. Many fungi have two forms; one that develops in the summer and will not live over winter; another form lives till spring. In the wheat rust these are known as the yellow and black rust. The yellow will live but a short time, while the spores of the black rust will live over winter. In Europe there is a form of the strawberry fungus not found in this country, that lives over winter.

In this country, minute but dense masses of fungus tissue are found which live over winter and send out spores, bearing threads in the spring, just like those that make white spots in the summer. Within these dense masses Mr. Earle has found indications of the formation of spores after the manner of those found in Europe. You may know better than I do of some varieties of strawberries being affected by this fungus disease, while some varieties are entirely free from it. You may perhaps have found some specially efficacious remedy. Mr. Earle has found that dusting the vines with lime before the maturity of the fruit helps a good deal. Then, after fruiting, another way is to mow the old leaves down—just go over the vines with a scythe and mow down the leaves of the plants. These leaves that are cut off ought to be destroyed in order to prevent the spores living over winter. But if the bed is very badly diseased it may as well be plowed up. Mr. Earle has obtained good results by mulching with straw.

The Black Rust (*Gloeosporium patentilleae*) begins with red spots as the White Rust does, but it soon develops a different appearance. It is most injurious to young plants and has destroyed some newly planted fields. It attacks Manchester badly.

A Member. I would like to ask the Professor if he can tell us anything about the leaf-roller.

Prof. Seymour. That is an insect. I have paid very little attention to the subject of insects and I will have to refer you to some one who

has made a speciality of the study of insects that are destructive to plants. Prof. Forbes has done a good deal of work on the insects which are injurious to the strawberry, and I can refer you to his reports, the Illinois Entomologist Reports.

Mr. Tuttle. We have always considered the rust that Prof. Seymour speaks of as being due to heat and sun-scald; I noticed two or three years ago that we had very moist weather in the spring and that the rust seemed to increase very much; and then when the weather became dry and the rust appeared to stop, the vines took a new start. This led me to think that the injury was not from sun-scalding, as then the rust seemed to abate.

Mr. Cutler. I never saw any rust on my vines until I got the Manchester, and they rusted very badly. Last summer, the season was comparatively dry and I was not troubled with it. It spread among the Manchesters, but I did not observe it on other varieties; I noticed the leaves were covered with dark spots.

Prof. Seymour. Probably that was the black spot rust that Mr. Earle found so destructive.

Mr. Pearce. How do those spores circulate, in the air?

Prof. Seymour. Yes, they are very easily carried in the air, as they are very light. In fact they are more easily carried in the air than ordinary dust.

A Member. I would like to know how they are produced, or how they germinate?

Prof. Seymour. They need moisture to germinate. They germinate by sending out a slender thread, and if they are on the surface of a strawberry leaf, they penetrate into it.

A Member. Do they multiply rapidly?

Prof. Seymour. Yes, sir; quite rapidly. There would be a large number of the spore bearing threads on each spot, and each thread bears a spore on the end. The number is so great that one couldn't count the spores; all of these produce an infinite number of spores.

A Member. Then I would understand that the air would be literally filled with these spores that are sent off?

Prof. Seymour. If they lived on indefinitely that would be true, but they probably do not. Probably after a length of time they would not germinate. After they have been dry a few days it is known they would not germinate.

A Member. I would like to ask if there is any relation between fire blight and rust?

Prof. Seymour. No, sir; I shall have something to say about blight later.

Mr. Pearce. I would like to inquire in regard to the different varieties that it affects,—is it more extensive on one variety than another?

Prof. Seymour. It is said to be. I am not a cultivator myself, and cannot speak from experience; but Mr. Earle has observed that very carefully, and if you will read his papers I think you will find some reference to that matter. I think you will find them in the reports of the Mississippi Valley Horticultural Society.

Mr. Fuller. In regard to that, I would say that I have raised about fifteen kinds of strawberries. I find that the Jersey Queen is most affected. I have never noticed it on the Wilsons, Crescent or Green Prolific. On the Jersey Queen it spread over a distance of about four square rods.

Mr. Harris. I found it on the Charles Downing, but it was worse on the Manchester than upon any other variety. I would like to ask Prof. Seymour if the application of sulphur would be effectual in destroying the fungi.

Prof. Seymour. Very likely, I don't know as that has been tried, but I should think it might be effectual.

GRAPE DISEASES.

There are several fungi affecting the grape that are known as grape rot, and the subject is a very large one; here are eighteen fungi affecting the grape berry. In this country probably more than one are called Black Rot. One of these is *Phoma uvaecola*, B & C. It causes the berries to dry up and fall off. Spore cases occur in black patches and contain a great many minute spores. The other one which has been called Black Rot has instead of spore cases, short threads in bunches that stand out on the leaf or bear the spores.

The American grape Mildew grows on the berries, but we find it oftener on the leaves. Brown spots, discolored by the action of the fungus, appear on the upper surface of the leaves. Opposite these on the under surface are patches of white; under the microscope, these are seen to be branching threads bearing a spore at the top of each branch. Within the leaf the fungus grows and special branches enter the cell cavities to suck up nourishment.

Now, these spores have a peculiar way of germinating. They live only a few days after they are matured. One may expect to have a new crop of spores every morning and sometimes a new crop is produced several times a day. As soon as they mature they fall off in a

drop of water. After about an hour and a quarter the contents of the spore divide up and the parts escape and swim around very rapidly about fifteen minutes and then they come to rest and germinate. If they are on the surface of a leaf where they can send out their threads they will propagate the fungus, but as I say they can't live over winter. There must be some other way and there is. This was discovered by Prof. W. G. Farlow.

The threads within the leaf produce thick-walled spores much larger and stronger than the other kind. They are called ovspores or egg-spores. They live over winter and germinate in the spring.

You will readily see that to burn the leaves would help to destroy the fungus, for the above is the only way in which it can live over winter. We can never hope to burn all of them, but we can burn most of the leaves of the diseased cultivated vines. The mildew grows on wild grapes as well as the cultivated ones. It is also found on the Virginia Creeper. This was first discovered at Lake Minnetonka by Prof. Farlow, a few years ago. It would reduce the mildew to destroy the wild grapes and Virginia Creeper.

The mildew does not confine itself to the leaf but runs into the berry. It probably does not originate in the berry but it goes through the stem. It gives the berries a brownish appearance, but when the spores are produced the berries are white. I have found them white all over with spores. Prof. Trelease found that the brown, rotting berries contained the fungus threads, and when kept moist spores were produced, making the berry white outside.

In Europe there is a white mold that grows on the upper surface of grape leaves, known as *Oidium Tuckeri*, but to what extent that occurs in the United States is uncertain. It probably occurs to some extent in New England.

In this country a white mildew on the upper leaf surface is common. It forms little black specks that are just large enough to be seen among the white threads. Under the microscope these black specks are found to contain the spores. It has been thought by some that there is a connection between this and the European mildew, but the black specks have never been found in Europe, and the connection is very doubtful.

Mr. Barrett. Can you tell us a remedy for these diseases?

Prof. Seymour. Destroying the leaves, as far as possible, is the best general remedy. You can't give a plant medicine, of course. About the only remedy seems to be to remove the diseased parts and

burn them. There is no way of curing the plant which becomes diseased.

Mr. Barrett. I was much interested in a statement that a great French physician makes a success with the treatment of diseased grape vines, by applying the principle of inoculation to the vine, but it is not stated how it was done or what was the substance used.

Prof. Seymour. I can scarcely imagine how it can be of any avail. I don't see how inoculation could help.

A Member. How are these fungus propagated?

Prof. Seymour. The fungi are propagated by germs which are carried in the atmosphere. It never originated without a germ. They answer the purpose of a seed. They correspond to seed in the higher plants.

Mr. Harris. Professor, for two years I have observed something which comes upon the grapes, and makes its appearance at first in a small round white spot, at one side of the berry, smaller than the head of a pin, but gradually extending and changing in color to a reddish brown and sometimes a reddish white.

Prof. Seymour. I think perhaps from the description it may be a grape worm if it is a small white spot, but the later development would seem to make it doubtful.

Mr. Pearce. I think that disease that Mr. Harris speaks of is rot. I was at Mr. Poole's place down near Farmington and saw it there. Mr. Rogers of New Jersey was present, and he called it the Grape Rot.

Prof. Porter. That is without doubt rot. I have been familiar with it for thirty years in the East. The characteristic of that rot is the peculiar iridescence that it has when you turn the grape toward the sun. I think you both are referring to the same thing, but have observed it at different stages. The grape affected by it is worthless. It never ripens; commencing with a small speck at one side it gradually extends in a circle, the white spot then shades off in a brown color.

Prof. Seymour. I don't think the subject is by any means exhasuted. There are eighteen species known in Europe, and I have no doubt there are a good many now in this country to be looked up yet.

PEAR BLIGHT.

In 1878, Prof. Burrill of the University of Illinois was the first to suggest the bacteria as the cause of pear blight. He mentioned them in the Illinois Horticultural report for about 1878, I think, but in

1880 he began more exhaustive researches and found that bacteria was certainly the cause. Besides microscopic studies he made practical experiments. His plan was to take a little piece of bark that was diseased and put it in a healthy tree and then watched it and after a few days, a week or more, the healthy tree would become diseased and begin to blight. Then he used another mode of experimenting. He took a little of the fluid from diseased bark on an inoculating needle and introduced that into the bark of a healthy tree. This produced the disease just as before. He not only inoculated the pear trees from pear trees but also pear trees from diseased apple trees.

He found that fifty-four per cent of the pear trees inoculated from diseased apple trees took the disease, and in the case of pears inoculated from pear trees seventy-two per cent. That shows very plainly that the disease is identical in the two trees; it is the same in the apple tree as in pears.

He also inoculated apple trees, but the experiments on the apples were not quite so strong; the disease didn't work quite so freely. The apple trees inoculated from diseased pear trees took the disease in only thirty per cent. In cases of the inoculation of apple trees he also found that the progress of the disease was very much slower than ordinarily supposed. He found that it did not start very rapidly; that it was always slow; he found that it progressed an inch or so in the stem up and down before it became noticeable and the leaves he found did not turn black until a week or so after the disease had spread in the bark. At first the color of the bark is only slightly changed; it becomes black gradually, and it is only after the disease has been there for some time that it is noticed at all.

Mr. Whipple. Is that the Fire Blight you are describing?

Prof. Seymour. Yes, sir.

Mr. Whipple. I have seen cases of Fire Blight when the first appearance on the leaves, the circle affected being probably one-sixteenth of an inch through. It looks as if it was scalded by throwing hot water on the leaves and similar to that made by a drop of hot water on the leaves of the trees, and probably the next day the leaves would be all white.

Prof. Seymour. Probably that is the beginning of the blackening of the leaf observable. Probably the stem had been diseased before.

Mr. Whipple. It is possible that such was the case, but I couldn't discover any trace of it before.

Prof. Seymour. This change is very slight at first.

Prof. Burrill found it is on the young trees that the blight works most easily. In the summer, during the time that he was making these experiments there were a good many thunder-showers; he could not find that the blight worked any more rapidly or slowly during the thunder showers than before—couldn't see that they had any effect. Later he found that the blight sometimes occurs in winter as well as in summer, although to less extent.

The bacteria that produces this blight is perhaps $\frac{1}{25000}$ of an inch; from this fact it is not surprising that not much has been found out by the use of the old microscopes, but the microscopes have been so much improved that we can get a pretty distinct view of them.

Mr. Pearce. I would like to ask if they attack the sound tissues of a tree?

Prof. Seymour. Yes, they attack healthy trees if there is a break in the bark, if the bark is rubbed off to allow them to enter. The tree is not diseased before they get in. They grow in healthy tissues and make them diseased. The cells of the bark contain starch, stored up in little granules as food for the tree. Healthy cells are full. When the bacteria get in, they destroy the starch grains and starve that part of the tree. They can not enter through the bark when that is unbroken, but they may get in through the flowers in some other way.

On motion, the meeting was then adjourned until 7 o'clock P. M.

EVENING SESSION.

WEDNESDAY, JANUARY 20, 1886.

The meeting was called to order at 7 o'clock by President Smith.

The following lecture was then delivered by Prof. A. B. Seymour, of the State University at Madison, Wisconsin:

SOME FUNGUS DISEASES OF SMALL FRUITS.

Mr. President, Ladies and Gentlemen:

Before speaking of any particular disease, I wish to show how and why fungi produce disease in plants. It is well known that the green coloring matter occurring in all our common plants has the power of converting inorganic matter taken from the soil and air into food materials for the plant. All plant food and indirectly animal food is

produced in this way. The plants known as fungi, however, have no leaf-green and therefore are not able to provide themselves with food from soil and air. They must derive their nourishment from either living or dead organic matter.

Different kinds of plants grow on different soils. Fungi choose places of growth in much the same way that other plants do, but much more closely. Some grow on almost any decaying vegetable matter; others only on dead wood of some particular tree. A very large number grow only on living plants and commonly each species only on plants of some particular family or species. Wheat rust grows on various grasses, the orange rust of berry plants, only on raspberries and blackberries, while corn rust is not known to occur on any plant but Indian corn.

Where do fungi come from? How do they get there? They never originate spontaneously but always from reproductive bodies called spores, answering the purpose of seeds. These are very minute and so light that they are borne in the air like dust, and some kinds are carried in water. Under favorable conditions if they are brought to the right kind of plant, as corn smut spores to corn, they germinate and send out a slender tube which answers the purpose of a root, and makes its way into the plant, often through breathing pores. Once inside, it grows and branches, sending its threads in various directions among the plant cells. Frequently special branches are produced, which enter into the cell cavities and act as suckers to take up nourishment.

Many fungi have different stages of development, reminding one rather of insects in their transformations than of plants. Each stage has its own kind of spores. Frequently different stages occur on different host plants, as in wheat rust. This produces on the wheat itself yellow summer spores and blackish spores which live over winter. The summer spores retain their vitality only a short time; only the blackish spores can carry the fungus through the winter. In spring they may germinate on a different plant, the barberry, and produce a third stage there; the spores from this stage, in their turn, produce yellow rust on the wheat.

It has been claimed that where fungi grow on plants, the plants first become diseased and weakened and the fungus comes afterwards, following and not causing the disease. This may be true in some cases, but in all ordinary cases of this kind the fungus is the true cause of the disease. Certain conditions of weather are favorable to its development, just as certain conditions are favorable to the development of any oth-

er plant; but the conditions which favor the fungus may be unfavorable to the plant it grows upon and so give the former a double advantage. Moreover plants have a greater power and resist disease when abundantly supplied with food materials, when they are not exhausted by fruiting, when every condition is favorable to robust growth; but the fungus may grow and produce the disease in spite of all this. A man in robust health is less likely to succumb to a contagious disease, as small pox, but still he is likely to take it.

There are several ways in which a fungus may produce injury to the plant. One way, common to all, is by taking away the food of the plant for its own growth. On green parts, they destroy part of the leaf-green and so reduce the power of the plant to supply itself with food; in many cases the leaves fall, as from premature ripeness. Frequently the fungus causes an abnormal development of plant tissues as in the black knot of the plum tree and the curl of the peach leaves; or they arrest development, as in the orange rust of blackberry, so that rusted leaves are smaller than healthy ones. In many cases the flower or fruit alone is destroyed, as in the smut of wheat and oats, "double blossom" of blackberries and the swelling of young plums.

ORANGE RUST.

The most striking and most destructive fungus disease of swell fruits is the orange rust, (*Cæoma nitens*, Schw.) which occurs on raspberry and blackberry leaves, and is especially destructive on the latter. This has been most thoroughly studied by Professor T. J. Burrill, of the University of Illinois, and many of the following facts are from his investigations. This rust appears as a thick orange coating on the under surface of the leaves and attains its greatest development in June.

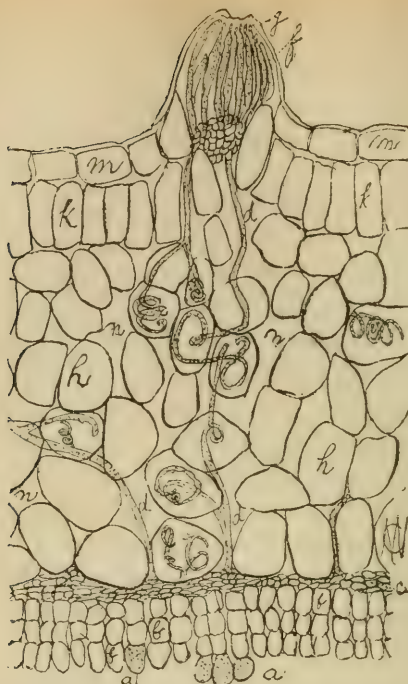


Figure 1—Orange Rust Fungus, *Uromyces nitens*, Schw. Cross-section of a diseased leaf; *a* spores; *b*, immature spores or sterile bodies; *c* bed of fungus issue; *d* mycelium threads; *e* suckers; *g* spermatogones; *h* cells of leaf; *m* epidermis of upper leaf surface. (After Burrill.)

The leaves do not reach their full size, are unusually rigid, and have a sickly appearance; something of this may be seen even before the yellow coating appears, and the latter at first appears in definite and paler patches, somewhat like scales, standing out slightly on the under leaf surface, covered by the epidermis, through which they afterwards burst. In this early stage, on the upper surface may be seen also yellowish specks, which on closer examination prove to be protuberances. There seems to be an exudation from these, which attracts insects.

Microscopic examination shows that the orange portion consists of a great number of roundish spores. Their surface is roughened with sharp points, by means of which it is possible that they adhere to insects crawling over the leaf and are carried by them to other plants. It is certain that they may be carried by the wind from place to place. They are produced in chains arising perpendicular to the leaf surface and those toward the inner end of the chain are either immature spores

or sterile cells. The spore chains arise from a bed or cushion of fungus tissue, from which may be traced the threads of mycelium running through the leaf tissues.

Some have special branches entering into the interior of cells and there forming coils, acting as suckers to take up nourishment. Some also extend to the upper surface, where they are connected with the yellowish bodies, *spermagones*, previously mentioned as occurring there. One of the epidermal cells is greatly enlarged and protrudes. In its cavity a thread produces a number of branches which extend nearly parallel toward the top and bear at their ends minute spore-like bodies, *spermatia*. Their office is not well known.

It has been believed by cultivators that this fungus lives over winter in the roots, and spreads to the stem and leaves in the spring; but this is not the case. It extends scarcely at all beyond the areas covered by the orange spores. More than this, it is found that the spores will lose their power of germination if deprived of moisture for a few days and will not live over winter. Hence it is believed that some other kind of spores is produced corresponding to the black spores of wheat rust, which carry the fungus through the winter. These have been carefully sought for, but heretofore without success.

Prof. Burrill has however at last found some evidence as to what they are, and it is hoped that his culture experiments, now in progress, will settle the matter definitely and lead to important practical results.

Some varieties of blackberries, especially the Snyder, are seldom, if ever attacked by this rust.

Remedies: Cut out and burn all deceased parts as soon as the disease appears, and as a preventive measure destroy any useless vines, as wild ones in fence corners or elsewhere, which might nourish the disease.

OTHER RUSTS OF BLACKBERRIES AND RASPBERRIES.

There are two other forms of yellow rust, one on blackberries only, the other on raspberries only, both inconspicuous compared with the preceding and never likely to be mistaken for it. They are quite similar to each other and bear yellow spores in minute pustules scattered over the inferior leaf surface. They sometimes do considerable damage but never approach the *Ceomas* in that respect. The general mode of growth much the same as in the *Ceomas* (Orange Rust) but the spermagones are absent and the spores are borne on stalks, from which they easily fall, instead of being in chains.

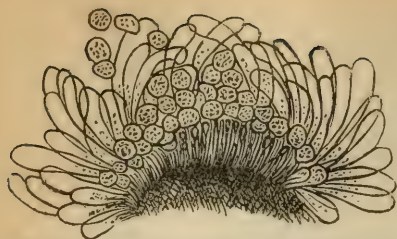


Figure 2—Summer or Uredo spores of the raspberry rust, *Phragmidium rubi-idaei*. Spore cluster surrounded by club-shaped sterile bodies, paraphyses. (After Winter.)

the names being determined by the winter spores. The yellow or summer spores of the two kinds differ but little from each other, but the form on blackberries is a little the more conspicuous. The winter spores are long, cylindrical, nearly black and tipped with a sharp point. The kind on blackberries is finely warty and divided by cross partitions into five or six cells; that on raspberries is coarsely warty and divided into seven to nine cells.

In this region the black raspberries are seldom attacked, but the red ones, especially in a wild state, quite commonly. The cultivated varieties of the red, Turner, Brandywine and Cuthbert, are reported to have suffered seriously from this disease at Jacksonville, Illinois.

The yellow spores come in August or September and the black ones soon follow. On the blackberry, the yellow spores come somewhat later, and the black ones have seldom been seen in this country.



Figure 3—Winter or telento-spores of raspberry rust, *Phragmidium rubi-idaei*.



Figure 4—Leaf of currant showing diseased spots.

A CURRANT DISEASE.

In Western Massachusetts last summer (1885) the currant bushes were badly injured by a fungus (*Septoria ribis*, Desm.) growing on the leaves. The same occurs in this region on wild currants and gooseberries, on the cultivated currant in Ohio, and on gooseberries in Kentucky. The disease appears as brown spots on the leaves, angular spots limited by the veins and soon becoming dead and dry. The spots are good sized and when large or numerous, destroy nearly the whole leaf. It certainly has an exhausting effect on the leaf and many leaves become entirely exhausted and fall off.

The microscope shows the presence of a fungus growing among the leaf tissues in the usual way, but its mode of fruiting is quite different from those described before. Within the tissues and somewhat protruding on the surface are minute blackish postules or spore-cases (perithecia). At the base of the perithecia, within, arise threads which bear the spores. The spores are colorless, very slender and thread-like, curved, pointed at the free end.



Figure 5—Spore of currant disease, highly magnified.

The life history of this fungus is unknown, but it is known that many of this group are only the summer stages of species which live through the winter and mature in late winter or spring, either on the same spot with the summer form, as in the black knot of the plum trees, or on different parts where the summer spores have

been carried and have germinated. Many fungi of this class produce their winter spores on fallen leaves or twigs, for instance the black blotch fungus of maple leaves.

It is probable that this currant fungus has some winter form on the dead vegetable matter about the bushes. Hence the remedy should be sought in burning the leaves that fall and any other rubbish that might harbor the fungus.

A similar species *Septoria rubi*, West. is very common on blackberries all over the country. It produces roundish spots with a red or purple margin and a brown center.

DOUBLE BLOSSOM.

"Double blossom" is the name given to a blackberry disease that is quite prevalent and destructive in some regions. It is a disease of the blossoms, as the name implies, but they are not actually double. The several parts are abnormally swollen through the effect of the fungus, so that at a casual glance the flower appears double. It is killed of course and no fruit is formed. The mycelium runs through the tissue of the floral organs, swelling and distorting them, and at length sends out on the surface clusters of short, colorless threads, which bear the spores on their ends and produce a whitish, mealy appearance over the flower. The spores are slender and pointed, frequently curved, and divided by cross-partitions into two to four cells.

This disease was first observed and studied by Mr. F. S. Earle. He sent specimens to Dr. Winter of Germany and the latter has recently described and published it as a new species, which he refers with doubt to the genus *Fusisporium* and calls *Fusisporium rubi*.



Figure 6—Spores of double blossom fungus, *Fusisporium rubi*, on blackberry. (After Earle.)

RASPBERRY CANE RUST.

The cane rust of raspberries and blackberries is rather inconspicuous but very destructive. It was first studied by Professor T. J. Burrill, who published an excellent account of it in the *Agricultural Review* for November, 1882. He states that it was first observed in 1878; since that time it has spread rapidly and caused great damage. One instance is given of a blackberry field that yielded a profit of four hundred dollars a year with promise of increase. This disease reduced it so that it scarcely paid expenses the next year.

The spots on the canes are rounded, of a grayish color and surround-

ed by a definite and slightly raised border. The fungus fruits by sending out clusters of very short, unbranched threads, each of which produces at the tip a minute, colorless spore, about twice as long as broad. It has never been definitely classified, but Prof. Burrill is inclined to class it *Sphaceloma ampelinum*, which produces one kind of black rot in grapes.

Remedy: Cut out the canes as soon as the berries are picked and keep the field clean.

In conclusion, I will say a few words about the treatment of fungus diseases in general. The thing to be continually and most earnestly sought is a knowledge of the life histories of the different species. This is essential to intelligent action, and this is what all earnest students are seeking. Some progress has been made, with good practical results. But it requires an amount of time and patience, care and accuracy, that one can scarcely conceive of till he has tried it and one can scarcely hope for success unless he has an absorbing interest in the subject for its own sake, as a science. Most of the world's valuable discoveries have been made by men moved by the love of science. No mercenary motive will answer in its place.

Besides interest and ability, a man must have means to work with. He must know what others have done and what methods they have used to gain their results; hence, he must have books. He must have microscopes and other apparatus for his investigations. Considering the interests involved, the amount of damage done to crops by fungi, the desirability of increasing the knowledge of the subject and of educating the people with regard to it, it would seem that the State might well afford to furnish the means for subsistence and for investigation to someone who will give his best efforts and interest to the work, such interest as only the work itself will satisfy, and which is essential to success. Yet results can not be guaranteed and much patient waiting and disappointment may be unavoidable.

In the meantime the best general mode of treatment is to destroy all diseased plants or part of plants and any useless living plants or dead matters that might harbor disease.

The following paper was then read:

CLIMATE, FORESTRY AND HORTICULTURE.

PROF. D. R. MCGINNIS, St. Paul.

It is not possible within the limited time necessarily allotted to the consideration of the many important subjects, brought before this meeting, relating to Horticul-

ture and its allied sciences to go into an exhaustive discussion of the relations of climate to Horticulture. The field is so broad and the connection between the two is so complex and they are so mutually interdependent on each other, that it is only by a series of long continued observations and a careful study of the results outlined thereby, that an intelligent understanding of this subject can be had. What we shall have to say this evening will refer to the climatic influences of the United States and more particularly of Minnesota and the Northwest on forest and plant growth. But first we wish to refer to those meteorological terms which by the operations of the signal service are brought so prominently before the public and which it is necessary that we should thoroughly understand before we can have an intelligent conception of the meaning which they convey. Those who are interested in the weather (and in this capricious and variable climate it is a subject of perennial interest) will often find in the predictions issued by the chief signal office, references made to areas of "high pressure" and "low pressure," to a probable increase or decrease of the same. It will be found that this refers to the specific gravity or weight, if you please, of the air, and changes in the same which from the expansion produced by the heat of the sun, varying amounts of moisture, the rotation of the earth on its axis and other causes is perpetually varying. Thus as an equal amount of dry, cold air is heavier than an equal amount of warm air saturated, or nearly so, with moisture and as the air within storm areas is always warmer and contains a greater amount of moisture than outside the storm's influence, it follows that the cold, heavy, dry air rushes in from all sides to the centre of the storm, but the revolution of the earth on its axis deflects these winds to the right of the centre in the northern and to the left of the centre in the southern hemisphere, causing the wind to blow in great spirals and thus setting up those great gyrotory systems of winds, blowing around a calm centre, which are called cyclones, or areas of "low pressure". An area of low pressure or cyclone is not necessarily accompanied by rain or snow. Sometimes, and often in Minnesota, it is the case that its energy is only expressed by high winds and cloudy weather, but it is safe to say that rain or snow will be an accompaniment of the cyclone during some part of its existence. In this latitude these great disturbances in the air move in a general course from west to east and taking advantage of this law, it is possible to predict the weather in advance of their occurrence; sometimes a product of the conditions to which the cyclone give rise is the "Tornado" with the effects and appearance of which, some of you are doubtless familiar, as Minnesota, though near their northern limit is within the region of their occasional occurrence. As there is a general and widespread misapprehension as to the proper use of the terms, "Cyclone" and "Tornado," we append the following as explanatory thereof, from the Weather Review of the chief signal office for October, 1885.

"A cyclone is a large, gyrotory storm, generally from 500 to 1000 miles or more in diameter with a considerable area of low pressure in the interior. A tornado consists of a very small and violent gyration of the air; generally much less than a mile in diameter, with a rapidly ascending current of air in the centre, and low atmospheric pressure very near the centre, although there is generally too much violence of agitation for it to be observed, and it is specially marked by a characteristic funnel-shaped cloud with a progressive movement."

A peculiarity of the tornado is that it invariably occurs a little to the southeast

of the storm center and usually at a distance of from 250 to 800 miles therefrom. As storm centres rarely pass more than 300 to 400 miles north of Central Minnesota in the summer, the season of their occurrence, it is probable that a true, well-defined tornado has never occurred north of the line of the Northern Pacific Railway.

The influence of climate on plant growth, whether for good or evil, depends on the relative proportion of the different agencies which give to each part of the globe its distinctive climatic characteristics. One of the most important, as we all know, of these agencies in limiting plant growth, is the amount of moisture which the air contains, the amount which is yearly condensed in the shape of rain or snow, and the activity of evaporation, which again depends on the dryness and temperature of the air. The warmer air is the greater inherent capacity it has for containing water in the shape of a vapor or gas, and therefore, its greater evaporating power; and this being so, it would follow that the higher the annual average temperature of a place the greater would be the need of an increased rainfall to supply the deficiency caused by an active evaporation, and consequently lost and not available for plant needs. Minnesota has twenty-eight inches of precipitation in the form of rain or snow during the year and Southern Texas the same amount, yet Minnesota has verdant pastures, fields of waving grain, dense forests, full-voiced rivers, and all those indications of a climate having a proper balance between the elements of heat and moisture, while the Central Rio Grande Valley, being much warmer, is possessed of essentially arid characteristics. A traveler commenting on this excess of evaporation, says: "To-day we had a violent thunderstorm during which torrents of water fell." Three days after he says: "From the effects of an unclouded sky and a burning sun all traces of the heavy rain have disappeared; the scanty vegetation is again drooping with drought and the earth a bed of dust."

One inch of rain during the bland summer of the Red River Valley is ample for plant needs for a fortnight. Provided the summers are warm enough to ripen the wood, forests in temperate regions seem to prefer the colder part of the temperate zone where though the annual rainfall is small, as in the British Northwest, and it be only from seventeen to twenty-two inches in the course of the year, yet there are found extensive forests of coniferous trees. That amount would be totally inadequate for plant needs in the warmer regions, but in that country the low annual mean temperature, by diminishing excessive evaporation, makes nearly all the precipitation available for promoting forest growth. It is also evident that forests are best suited to those places where the rainfall is not restricted to a part of the year, leaving the balance dry and endangering the integrity of the forests from fires during the dry season. California and the North Pacific coast with their magnificent forests of conifers would seem to be an exception to this but it will be remembered that although California is almost absolutely without rain during the hot months, yet the forests are there invariably found where from proximity to the ocean or from great altitudes, the absolute or relative amount of moisture in the air is so very great that by diminishing excessive evaporation it practically takes the place of rain, and husbands the moisture derived from the heavy snows and rains of winter through the long months of drought until the rains come again. The forest regions of the North Pacific coast do indeed have a rainfall during all the months of the year, but this is so small during the summer and so near the limit of excessive dryness that a very small diminution from the normal amount invariably produces

those destructive forest fires of which we read, as in summer of 1883, that they raged for weeks and so filled the air with the smoke of their burning, that the sun appeared as a ball of copper and the obscurity at midday so great that navigation was rendered most difficult and dangerous.

In the Northwestern angle of Montana, up near the British line is also a grand forest covering several thousand square miles of mountain and valley, and existing under the same climatic conditions as on the coast, except that perhaps remote as it is from the ocean a more narrow margin exists as to limiting dryness, thus making the danger from destruction from fire greater than on the coast. A lumberman from Wisconsin who has carefully examined this forest, on being asked if he did not fear competition from this source with the lumber of Minnesota and Wisconsin, said: "The climatic conditions under which this forest exists are so precarious that since the Northern Pacific Railway has penetrated the heart of this region, making it accessible to the destroying hand of man, that I expect in ten years to see it obliterated by fire from off the face of the earth." It is a source of gratification to those who have the best interests of the country at heart to know that this great danger is appreciated at its full value and that a prominent member, with wise foresight, has introduced a bill in Congress providing for the withdrawal of this tract from settlement, and containing provisions looking to the preservation of this forest tract in a manner which while providing for its perpetuation, will secure the proper use of its resources to the people.

Minnesota from its geographical position in the centre of the continent, nearly equi-distant from the oceans and their modifying influences, has in common with all other countries similarly situated in its latitude, an essentially continental climate. The effect of this remoteness from these equalizing influences is to cause great differences in the seasons, the winters being cold with great extremes of temperature and the summers warm but not hot, and the amount of moisture to be decidedly variable in quantity. These variable qualities of the climate, while undoubtedly very favorable to the best mental and physical development of man, and by the avoidance of the diseases and pests of warmer localities peculiarly adapted to the profitable production of live-stock have an important limiting influence on perennials or those plants in which growth and development do not take place in a single season. While the summers have an almost ideal temperature and rainfall for the development of the apple, pear, peach and other fruits of temperate latitudes, in their highest perfection, the great extremes of cold during the winter except under favorable local influences are almost if not quite decisive against their profitable production. It would seem that the intelligent horticulturist recognizing these inevitable limiting influences, would seek to produce those fruits such as the Russian apple, the plum, raspberry, currant, cranberry and other small fruits, which seem not only to be tolerant but absolutely to require a cool climate to suit the requirements of their best growth.

As to the parts of the State most suited by climate to fruit raising, the southeastern part in the partially timbered counties, and that part north of the cities of Minneapolis and St. Paul and east of the Mississippi, extending north to the Northern Pacific Railway and Lake Superior, will undoubtedly, by reason of the heavy forest belt and its proximity to the equalizing influence of Lake Superior be exceptionally favorable to the growth of the grasses and small fruits.

Regarding forests, it would perhaps be interesting to give some of the results of observations taken during the year just past at stations of the State Weather Service on their influence as a modifying agent of the climate of Minnesota.

Scientists agree that while the evidence at present available does not fully establish the fact that forests increase rainfall, other than to a slight extent, yet no fact is more apparent than that they serve a most important part in the economy of nature, by averting extreme and sudden changes in temperature, and more particularly by protecting the earth from the direct rays of the sun and drying winds, to check excessive evaporation and husband the rainfall, permitting it to gradually sink into the ground only to again appear in the form of springs which feed the rivers; a full and constant volume of which is so necessary to the economical prosperity of the State. As an instance of the important part played by the forests of Minnesota on the volume of water in two of its principal rivers, it may be stated that the Minnesota river has a drainage area of 19,000 square miles, nearly destitute of timber. The Mississippi, above their junction, a drainage area of 23,000 square miles, nearly all forested. As a result, at the confluence of these two streams the Mississippi drainage area furnishes at least seven times as much water as the Minnesota area. Let the present rapid deforesting of Northern Minnesota be continued, and aside from the influence of the government reservoirs, the amount of water in that stream will ultimately assume insignificant proportions and become practically unavailable for manufacturing purposes.

The beneficial effects of what are called the "Big Woods" in arresting sweeping air currents and gales, a result so much to be desired in this climate, will be appreciated when it is understood that Bird Island on their windward side has in round numbers a movement of 8,500 miles of wind each month, and St. Paul on the leeward side only 4,000, less than half as much as it will have when that forest is cleared away, as it surely will be unless the people of this State awake to the importance of its preservation.

Another undoubted influence which the Big Woods have is by their resistance to the free movement of the air, to cause many of those bodies of frigid air called "cold waves," which sweep down from the north, to be deflected over the broad treeless plains of Dakota and Nebraska and, as was instanced last autumn, to be often felt at St. Louis, Mo., before they were, if at all, at St. Paul. They, with Lake Superior, cause the winter isotherms or lines of equal heat to extend nearly north and south instead of east and west, and thus make Duluth and Minneapolis nearly if not quite as warm as Sioux City and Yankton. Similar instances of the mild and genial influences which this forest exerts on the climatology of this State could be multiplied indefinitely. But we will close this paper by expressing the hope that the people of Minnesota will in the near future supplement those at present in force by a code of forest laws looking to the preservation of a proper percentage of the existing forests, and their extension over the treeless part of the State; these laws to be based on an intelligent conception of the necessities of the present and the demands of the future.

The following paper was then read :

AESTHETIC FEATURES OF HORTICULTURE.

By H. H. YOUNG, St. Paul.

Our American ancestors, having little leisure to devote to anything not intimately connected with their necessities, were compelled by circumstances to take strictly utilitarian views of life. Contemplation of the beautiful did not contribute to supplying their physical wants nor augmenting their fortunes, hence they left it to poets and other imaginative impracticables, whose utopian ideas seemed to them only worthy of derision. They appreciated solely the beauty of what was useful, and, in their eager pursuit of competencies for themselves and families, whatever seemed most available for service in this direction became admirable, though it might in itself be ugly to the degree of repulsiveness. Even the comely person of the marriageable damsel, who lacked ability to assist materially in laboring for the maintenance of the family, or was without a considerable dower, was less attractive than homely efficiency, or wealth. Heaven itself, instead of being a bower of bliss like the ancient garden of Eden, with its groves, and meads, and murmuring streams, became to them a magnificent city built of precious stones and paved with gold, and had no tree but the tree of the bread of life growing therein.

There was, however, a sufficient excuse for those rugged and eminently practicable grandsires and forebears to disregard the beautiful. Their hands and thoughts found other tasks for their employment, than the formation and contemplation of what was merely ornamental and elegant. It fell to their lot to enter upon and open up for civilized occupation a new and wild country. To invade the dense and extensive forests and clear them off in order to make room for their own homes in the wilderness, and to open patches of land for cultivation, and they accordingly laid waste lustily with axe and fire, without discrimination and with little concern for the future wants and wishes of the race. Majestic oaks and elms, poplars and maples, walnuts and hickories, fell crashing to the earth beneath their stalwart blows, and, with graceful sycamores, wide-spreading beeches and pliant willows, were consigned to devouring flames. None were spared because of their grandeur or gracefulness, but large and small, stately and deformed, valuable and worthless were alike included in the general sentence of condemnation, which pronounced them useless cumberers of the ground and obstructions to the growth of golden grain and other nutritive products of cultivated lands.

When a farm was being opened in that age, the universal prevalence of the forests was reason enough in itself why no thought should occur to them of leaving trees for ornamenting the grounds about their residence sites; and, as groves in its vicinity would have been senseless superfluities, because of the proximity of the wild-woods, it could not be expected that care would have been taken for their preservation. The desirable thing to be accomplished was to clear the land of its timber, in order that the fructifying beams of the sun might have free access to the soil, and the sooner this was done the better for the welfare of the settlers. So, too, in laying out a new village, parks and shade trees were unnecessary, the demand of the hour being for open space on which to build and plant gardens and grass plats. If some venturesome wight of Aryan instincts, who recognized tem-

ples to the living God in groves of majestic trees, or whose prophetic vision penetrated far enough to enable him to perceive the wants of generations to come, had suggested preserving a park or grove, as a place of popular resort for all time to come, he would only have drawn upon himself the ridicule of his fellow citizens, and no doubt been so jeered and mocked at as to render his life thereafter in that neighborhood decidedly unpleasant. With abundant forests surrounding them on every side, it was impossible for the people of that period to imagine the sentiment that our experiences have made common with us.

Looked back upon superficially from the present, that unreasoning devotion to a narrow utilitarianism, seems only less excusable than the irrational enthusiasm that condemned to death those accused of witch-craft. In both cases the results of their misguided zeal must occasion emotions of regret; but we ought not to forget that the conduct itself grew out of honest motives for the welfare of society so far, at least, as the great mass of actors in both instances were concerned. That mistakes were committed in both cases is not very strange. Mankind has been fated to the commission of errors since Eve accepted the forbidden fruit in paradise: and we with all our enlightenment have not escaped errors or freed ourselves from liability to err.

There were two reasons why our forefathers could not realize the value of the forests. The first, the almost universal prevalence of heavily timbered country, has already been mentioned; but the second, the demand for timber for building and fencing on the prairies, for the construction of farm machinery and for railway ties and telegraph poles they could have had no conception of whatever. They were ignorant of the existence of these vast, unwooded plains, and of farming machinery, telegraphs and railways they did not even dream. Had any one predicted even fifty years ago, the extent of the demand for timber that now prevails, and the variety of uses to which it is applied, his sayings would scarcely have commanded more attention than the ravings of a lunatic. It was the mission of our ancestors to clear the land for cultivation. Trees were their enemies, just as much as the Canaanites were enemies of the ancient Hebrews, and for the same reason, that both occupied the promised land. The first business of the latter, after they crossed the Jordan, was the wiping out of the idolatrous nations; and the first duty our ancestors were called upon to perform on this side of the Atlantic, was the denudation of the land of its excessive growth of timber. Both it seems left a Gibeonitish remnant for future usefulness; in the case of the Hebrews, this was unfortunately too numerous for the happiness of their posterity, while our fathers cut somewhat too closely for our good. We may regret the consequences of their zeal but should not reflect unkindly upon their memories for that reason.

Through their toil and privations we have come into goodly possessions; and their devotion to what was useful, affords us time and opportunity to study and enjoy the beautiful. But are we doing this as diligently as we should? Do we not inherit too great a proportion of their devotion to utility? Have we really learned that there is usefulness in beauty? That it is this which refines our manners, purifies our desires, elevates our thoughts and makes our lives more enjoyable? Have we learned to serve God more acceptably amid agreeable surroundings, than under circumstances ungrateful to the physical senses? If we have not, we are still unable to appreciate the beautiful, and should strive to educate ourselves up to a

higher standard of æsthetic culture. We certainly have learned that beauty and utility are not incompatible terms, and but few among us will dispute that the study of æsthetics is quite as important as much of the learning now considered essential in our schools. That the acquisition of this knowledge is more agreeable than that of much else which is taught, and that its pursuit has a salutary influence on the mind and life of the learner will, I think, be universally admitted.

But the inculcation of a lesson in æsthetics is no part of the intention of this paper, and I fear that I have already used too much of your time in introducing the theme proposed in the title, but hardly yet alluded to. If you will bear with me a few moments longer, however, I will endeavor to apply the ideas I have advanced to the science of horticulture, and ask for this branch of the study the recognition and approval of this association. In most other of the practical sciences, the importance of æsthetic features is already acknowledged. The outer decorations of our dwellings with handsome cornices, graceful columns, ornate towers and castellated chimney tops, do not affect the health and comfort of the inmates, yet they are recognized as essentials in architecture, and add largely to the value of the building. Even the renter of a humble tenement, who earns his money by his daily toil, will willingly pay more for a residence that has an attractive exterior. The same desire to embellish and beautify is also manifested in the interior finishing and furnishing of modern residences. Even the cheapest quality of furniture must make pretensions to beauty to find purchasers; and while many of the window trimmings, wall hangings and other decorative objects may yet exhibit crudities of taste, there is certainly vast improvement in this respect within the last quarter of a century. The old fashioned window shades and half curtains are relegated to attics and unused apartments, to make room for graceful lambrequins and laces. Common wood cut prints and black silhouettes are banished from best rooms, and their places usurped by well executed engravings, chromos and photographs; and in place of wreaths and ornaments of straw and autumnal leaves, we now find elaborately wrought embroideries and other truly artistic ornaments. The flower beds and borders which ornament the house yards are no longer limited to a few varieties of common flowering annuals, but teem with a profusion of gaudily colored exotics, gathered from every land with which we have commercial intercourse. Even business houses and offices of professional men seem to have caught the infection, and wherever we go our eyes are gratified to observe efforts at decoration more or less tasteful and mature.

In short, we are unconsciously tending, in every walk of life and among all classes of society, to increased love for and devotion to the beautiful, and it behooves our horticulturists to accept the situation and strive to discover and teach correct rules for decoration in selecting varieties of trees and shrubs for groves, yards and streets; and in planting and training the same so as to produce the happiest effects. If this is done now, in this western country, we shall escape the infliction of a long succession of incongruities and crudities, through which the individual members of the community will each endeavor in his own way to arrive at the knowledge for himself. Even now, if we will take a cursory look through our respective neighborhoods, we can hardly avoid perceiving what results such individual experiments must lead to. In a large level yard, where the ground is covered in the spring and early summer with a luxuriant growth of grass, and where shade is essential for

beauty, how often do we find a few scraggy pines or cedars, with limbs starting out nearly level with the ground and tops running up to a peak; mingled, perhaps, with half a dozen slender poplars or spindling ashes, none of them casting enough shadow to shelter a cat or dog. On the other hand, it is by no means uncommon to find wide spreading and thickly foliaged maples, box elders and lindens occupying limited areas, and completely shutting out from the ground beneath the light and warmth of the sun. Look, too, along the streets of many of our cities and villages, at the incongruous varieties of shade trees which are frequently displayed: many of them possessed of beauty in themselves, but robbed of their charms by the associations in which they are found.

Do not these sights evince a want of knowledge, and prove that instruction is needed, as to what is truly tasteful in the selection of trees? I think so. But the greatest need, perhaps, for æsthetic training in horticulture is shown in many of our public parks. I have now in mind a handsome little park, that might be a perfect gem of beauty, but for the uncultivated taste displayed in the selection and training of the trees. These are all tall and limbless to the height of at least fourteen feet, with tufts of tops scarcely exceeding four feet in diameter and so sparsely limbed that the sunbeams shine so freely through them that they serve little more purpose of shade than flagstuffs would. True they may, in time, put forth additional limbs, but under the most propitious circumstances they can never grow to be good-looking nor to serve fully the purpose for which they are designed. In another city, I know of a much more extensive park where the trees are all low and bushy, and all of the same kind. In this instance, too, they are planted in straight rows as though beauty consisted in exactness of parallelograms. I have frequently been led to suspect, when observing shade trees on the sides of streets, that the rule observed by those who planted them was: to put the least umbrageous trees along the widest streets where they would do the least good, and the widest branched in the narrowest thoroughfares where they would be the greatest possible nuisances.

Somebody has said that true beauty consists in contrasts, but I beg leave to differ. It will not do to announce that, even as a general rule. Nor is it true that sameness is beauty. Congruity, fitness, adaptation, are necessary to awaken the delight of those perceptions which recognize beauty. It is these relations to each other that constitute harmony between a series of objects, or between the several parts of the same object. Without harmony there can be no beauty, either physical or moral. This is true of music, painting, architecture, and, indeed, of every branch of art, and it must be equally true of horticulture. A degree of contrast is, of course, necessary to harmony; but violent and inharmonious contrasts are always more or less offensive to the perceptive faculties. Suitableness is a far more essential quality in æsthetic culture than contrast; for that which is not suitable, not adapted to the situation it occupies, or the use which it designs to serve, must be a positive deformity, although beautiful under other circumstances.

Large trees in confined localities dwarf the grounds they occupy into insignificance, and tall spindling trees palpably develop their own poverty of foliage in roomy situations. Such arrangements of objects are obviously inconsistent in their relations, and disfigure rather than adorn the scene. Let there be variety and contrast, but keep these attributes within the bounds of congruity. A little reflection ought to convince us that careful and mature study is required to enable us to se-

lect, arrange and train shade trees, whether in public parks, along the sides of streets and avenues, or in private grounds, so that the most charming effects will be produced; and as no one probably now-a-days will deny that the contemplation of beauty tends to refinement and moral elevation, it will be generally admitted no doubt, that the results of such are as likely to prove compensatory to the community, as those arising from devotion to music, painting or any other branch of the fine arts. That the subject is eminently worthy the attention and fostering patronage of this association, will not, I hope, be disputed. It should not be limited to trees either, but so extended as to include all kinds of ornamental shrubbery, not omitting regard for the effects produced by the various colored blossoms and flowers.

Nature, we are told, affords innumerable practical lessons touching every department of this subject, and is a reliable and proficient teacher. This is true, if nature shall be sagaciously interpreted, but who trusts to nature alone for instruction will find himself ultimately in possession only of a mass of crude ideas, which he can hardly render available for any use. It would be scarcely more blameworthy to depend solely upon nature for revealing the wonders of the science of astronomy or opening to our comprehension the deeply hidden facts of geology. To educate ourselves thoroughly and successfully in any science, simple or intricate, we must become acquainted with the thoughts and opinions of our fellow-men respecting it, must learn the results of their observations and experiences; otherwise we are likely to grope in darkness and ignorance from infancy to old age and leave the world no better by our having occupied a place in it. Moreover, by availing ourselves of all the opportunities afforded for acquiring information, we shall become better able to realize and enjoy the salutary influence of the beautiful on our own lives, and live the happier and die the more blessed for the knowledge we have gained through toil that yielded us joy even in its performance.

The following paper was then read:

LANDSCAPE GARDENING.

CYRUS L. SMITH, Minneapolis.

Fifty years ago the art of Rural Adornment was comparatively unknown in America; to-day we boast of many magnificent parks, while public buildings throughout the entire country are surrounded with gardens and grounds rich in treasures of tree, plant and flower. Fifty years ago whatever we had of rural adornment was an imitation of the English or geometric style; to-day we have a system of landscape agriculture that is distinctively American. Imperceptably the spirit of this system has influenced the work of those engaged in rural improvement until to-day we can hardly find a trace of the old system. More than that, the American idea of landscape architecture, or rural adornment has crossed the Atlantic, and like other American ideas, is supplanting those of England, France and Germany. The credit for this is due largely to A. J. Downing, who might appropriately be styled the founder and apostle of American landscape gardening.—a man of rare good taste, a finished scholar and ready writer of enthusiastic nature; thoroughly in love with his profession, he was peculiarly fitted for his great work; he has, however, had many willing, enthusiastic and able disciples, whose labors

around the suburban homes of Boston, New York, Washington, Chicago and other cities speak not alone of the abilities of the teacher, but show also that the students have been quick to learn and profit by his teachings.

To the careful observer it must be at once apparant that the art of rural adornment is only in its infancy. The work of the park commissioners in the city of Minneapolis during the past year has taught the people of the city, as a whole, more in this subject than they had learned before during our thirty odd years of existence as a city.

Rural adornment is a Kindergarten school where object lessons are being taught day by day that are remembered and acted upon, the restless ambition of the average American citizen to out-do his neighbor will constantly develop new ideas in this as in other things; some of these ideas will be crude and inappropriate at first but another and more skillful mind takes off a little here or adds a little there, until it develops into a thing of beauty and pleasure. To foster and encourage these ideas and to cultivate a taste for the true and the beautiful in the adornment of our rural homes is certainly within the province of this Society. Very few perhaps have the ability to lay out and suitably arrange even a small garden plot yet nearly every one can recognize the difference between the place where walks, trees, vines and buildings are tastefully arranged, even where there has been lack of taste displayed. Beauty of outline, harmony of shape and color, are pleasing to the eye and fill one with feelings of pleasure.

I do not understand why the press of the western cities do not pay more attention to a subject of such general interest, although every year shows marked improvement: still there is a vast amount of time, money and good material wasted on account of ignorance in regard to even the first principles of rural adornments. It will be my aim in this essay to point out some of these principles, as I understand them. I write for the climate of Minnesota and with the experience of twenty severe winters, as many summer droughts, and many exasperating failures.

THE GROUND

To be adorned is of most vital importance. My ideal is an undulating surface, similar to that on the shores of Minnetonka. Where it is possible, let your grounds embrace a bit of water; if naturally, so much the better; if not, have it artificially if you can. Don't make the too common mistake of clearing away the timber and leveling the ground; this seems to be a sort of mania with some people. No sooner do they acquire a bit of ground than they proceed to level it. The work Nature has done,—the graceful, sweeping curves, the rounded slopes,—are all squared and leveled; then they are ready to improve. As a rule you cannot improve upon the slopes and curves of nature; a little touching up here and there is all that will be necessary.

Rural adornment is to be accomplished with an artistic arrangement of grass, trees, vines, shrubs and flowers. The arrangement of your grounds should be such as to give a place for each of these, so that while they have each a character and individuality of their own, they will together form a perfect whole that will be harmonious and beautiful. The rear, or blind side of the house, stables and kitchen garden, should be concealed from view by trees and shrubbery or grape trellises, the outlines of which should always be rounded; the stable yard should be reached by a curved drive; the wood yard for drying clothes, and everything that could in

any way mar the beauty of the place should be concealed by screens of vines or trees. In the arrangement of trees be careful not to shade the house too much, never planting trees or allowing them to grow so near the house or so thick that grass will not grow; sunshine is more necessary than shade. Draw your plans carefully, picture to yourself just what the use and effect of each walk, tree, or shrub will be, never forgetting that grass is the most important factor in the arrangement. When your plans are completed and revised to your satisfaction, the next thing is the preparation of the soil. Here very much will depend upon conditions. A rich, dark loam, with a slight mixture of clay, is best; if you have this, all that is necessary is to work it deep (eighteen inches to two feet); but if the soil is poor and sandy you must add clay and manure; if cold, heavy clay, add sand and manure.

LAWNS.

How can I best obtain a fine lawn? is a common question, and one that should be carefully studied, for it is the crowning feature of any rural home. This cannot be obtained by laying down some sod on a sand bank, with perhaps a few inches of soil; nor by heavy surface manuring. The ideal lawn is smooth, velvety, rich, dark green, from April to November. To obtain this, good rich soil is essential, and the right kind of grass and frequent manuring.

If the soil is not good make it so. I consider cow manure the best to be had. Don't forget to work the ground two feet deep on small plats; this can be done with the spade; and larger ones, with the subsoil plow, using the manure while subsoiling. Let the surface be made smooth, rolled evenly, all stones raked off, and you are ready for the seed. Use about two bushels of red top, three of blue grass, and ten pounds of white clover to the acre. Some will say this is too much, but what is wanted is a smooth, velvety surface. Do not sow any oats, timothy, or any other coarse grain, or grass, and never allow your lawn to go to seed; never mow it after October 1st. Give a dressing of well-rotted manure in November; do not walk or drive on it in the winter; never allow slops to be thrown on the lawn in winter; it will injure it worse than in summer. If there are patches that annually turn brown in July and August, dig them up, work in cow manure quite freely two feet deep and re-seed it. If little hollows appear gradually fill them up, adding one-half inch or more of loam at a time. Do not water in the middle of the day; if you use water apply it freely in the evening, but if the ground is properly prepared nature will provide all the water that is necessary. Having your lawn once in good condition go over it once every two weeks with the lawn-mower, and at least four or five times each summer with a heavy roller. One who has never tried rolling a lawn will be surprised to see how much it adds to the smooth, velvety appearance so much to be desired, so greatly admired and so seldom acquired.

WALKS.

Having thoroughly marked the soil and got it in proper condition, lay out your walks and drives; ordinarily these will be graveled. The soil should be excavated four to six inches for walks, and eight to twelve inches for carriage ways, and filled even with the surface with gravel; never raise the walk above the level of the lawn nor leave it, as is sometimes done, a few inches below. It is the least ornamental part of the grounds and should attract as little attention as possible. Walks should be not less than three nor more than five feet in width; nine feet is

a very good width for drive-ways; eight is wide enough; for large grounds ten feet looks well. Lines should always be curved and they should follow the slope of the grounds in such a way as to carry off the water freely, either winter or summer. The edges should always be kept smooth and even; the gravel should be screened, and whether coarse or fine, should be as nearly uniform as possible, crushed stone is very nice for walks or drives, and where it can be procured as cheaply as gravel it would be preferable; if you are troubled with weeds or grass in the walks use salt freely, it is the cheapest way to keep them clean.

Having arranged the grounds, walks and drives, we now come to the selection and arrangement of trees, for these are the crowning feature of all rural adornment; it is here that all the faculties of the mind are brought into full play. Color, shape, rapidity of growth, adaptability of soil, and exposure, relation of surrounding objects to each other, all these and many other questions must be considered before we decide what to plant. If, as is frequently the case, there are native trees already on the ground, they should be utilized as far as possible. We have in Minnesota such an abundance of ornamental shade-trees whose characteristics are so perfect we have no need to go abroad for trees to ornament our grounds. The following list of deciduous and evergreen trees we consider sufficient for the purpose of adorning the largest ground. With the exception of the six last named, and we could very conveniently dispense with them, they are all natives of Minnesota, well adapted to our soil and climate; if properly planted they will live and grow strong, healthy and beautiful, very much superior to any of the sick, stunted, worthless importations that cost so much and amount to so little.

Following is a list of trees suitable for ornamental planting, found growing naturally in the forest of Minnesota:

White Elm, *Ulmus Americana*; Rock Elm; Corky Elm; Slippery Elm; Hard or Sugar Maple, *Acer Saccharianum*; Red or Scarlet Maple, *Acer Rubrum*; White or Silver Maple, *Acer Dosycarpum*; Ash Leaved Maple (Boxelder,) *Negundo*; Hackberry, *Celtis Occidentalis*; White Ash, *Fraxinus Americana*; Green Ash, *Fraxinus Viridis*; Black Ash, *Fraxinus Sambuci Folia*; Basswood or Linden, *Tilia Americana*; White Oak, *Quercus Alba*; Burr Oak, *Quercus Macracarpa*; Red Oak, *Quercus Rubra*; Black Oak, *Quercus Tinctura*; Jack Oak, *Quercus Nigra*; Black Walnut, *Juglans Nigra*; Butternut, *Juglans Cinerea*; Black Cherry, *Cerasus Virginiana*; Bird Cherry, *Cerasus Pennsylvanica*; Several varieties of willow; White Birch, *Betula Papula Folia*; Yellow Birch, *Betula Excelsa*; Cottonwood; Iron Wood, *Oleua Tesuta*; Tamarac, *Tarix Americana*; White Pine, Jack Pine, Red Cedar, White Cedar, Black Spruce, White Spruce, Balsam Fir, Lombardy Poplar, Silver Poplar, European Larch, Scotch Pine, Austrian Pine, Norway Spruce, *Abies Excelsa*.

One would not be expected to use all of these varieties on a city lot of half an acre or less, but for the farm or for exurban grounds of three or more acres they could be used with good effect. If there is only room for one tree plant a White Elm; if two, an Elm and a hard maple. I place white elm first on the list, but at the same time some of our tree planters think too much of the elm. The boxelder is a very fine tree, hardy, quick-growing, starts out early in the spring, makes an abundance of shade, requires very little care, is easily propagated and bears transplanting well. But of all the varieties of trees, taking shape, color and everything into consideration, the hard maple is the king: naturally upright and symmetrical

in shape, it produces a profusion of rich, beautiful green leaves, in early spring that, after furnishing shade all summer, change in autumn to all the rich and gorgeous shades of yellow, brown and red, giving to the autumn landscape brighter, richer and a more dazzling show of color than any half dozen other trees combined. Any park, garden or ground that has not the hard maple is incomplete, like a church without a steeple, a flower garden without a rose, or home without a wife. The objection usually urged against this best of all trees is that it is shy of transplanting, grows slow, is liable to die out. Admitting this to be true, still the tree is worth extra care in transplanting, extra preparation of the ground and a little nursing and petting afterwards, for if you have and admire the best and most beautiful in all that goes to make up a perfect landscape, the hard maple will liberally reward you for the care and labor necessary to grow it in perfection. To grow good hard maples the soil must be moderately rich, deep, cool and moist; it will not thrive in dry, hot sand; it must be transplanted either late in autumn or very early spring. If the soil is sandy remove three or four cubic yards and replace with clay loam. A description of each tree, their habits and peculiarities would make this paper too long.

The size of the grounds, the shape and arrangement of the buildings must be studied to determine what is best to plant. As a general rule at least two-thirds of the ground should be unbroken lawn, free from trees or shrubs of any kind. The lowest growing trees should be planted in front and nearest the house; most people make the mistake of planting too many large growing trees. Another thing to be studied is the view beyond your own grounds; study how far you can use the good things of your neighbor and make them add to the attractiveness of your own grounds. For instance your next neighbor has a few beautiful trees, but some unsightly out-buildings, arrange your own trees so as to screen the out-buildings and give you the benefit of the trees. Let the lawn space be widest towards the house or street; do not use shrubbery promiscuously over the grounds, but group them together; do not have many flower beds and those you do have arrange with regard to the shrubs and trees adjoining; avoid the use of statues, vases or rustic ornaments, except in shadowy places; there are places where a rustic ornament, a pile of rock-work, or something of the kind may be used effectively, but such places are not common. A fountain on a quarter acre lot, or a dray load of rocks on a lawn of a few dozen square yards is scarcely in good taste.

Ornamental hedges can often be used to advantage. The finest hedges in the State are made with the Norway Spruce. It is a hardy, thrifty, compact grower, with an abundance of fine, rich dark-green foliage, bears shearing well and can be trained in any desired shape. The Arbor Vitæ and the red cedar are both used for hedges with good results. For a deciduous ornamental hedge the common purple lilac is very nice, making a compact hedge; the foliage is abundant and rich in color and it flowers in profusion. The common wild plum, planted thickly and kept sheared in shape, makes a fine hedge, that will show a pretty bank of snowy blossoms in May. Climbing vines are often used with good effect; the hardiest and most successful climbing plant is the Virginia Creeper, (*A. Quincifolia*;) this is a very free climber with abundant foliage, that colors finely in autumn; it is very easily increased by layers and would be used much more than it is if people generally understood how easy it is to propagate it, and the little care required to grow

it successfully. The Bitter Sweet is a fine hardy climber, with very heavy, dark green leaves; it also has a profusion of berries that hang on all winter; they are a bright orange or scarlet, growing in clusters and look very pretty. The climbing honeysuckle or woodbine, is another hardy, pretty climber that flowers freely in June and July. Wild grape vines, also Clinton, Oswego and some other sorts are good to cover summer houses, trellises, screens or dead trees.

TRANSPLANTING EVERGREENS.

The same general directions will apply, except that the season for planting is, in Minneapolis, from May 15 to June 20. The exact time when they would do best would be just as the terminal buds begin to burst. The tops will not require much cutting, but the roots must not be exposed to the direct rays of the sun, not even for a few minutes, their resinous substance being easily coagulated by light or heat, and once changed it can never be restored.

DISCUSSION.

Mr. Kellogg. Mr. President, I apprehend we have forgotten all about what the vice president said. I could refer to my notes, and call for a good many questions, but this last paper and the other valuable papers that have been read this evening I think will be more profitable to discuss for a time than to go back.

Mr. Sias. Did I understand Mr. Smith to say that his deciduous trees were all native except the last six?

Mr. Smith. Yes.

Mr. Sias. I would like to inquire if you consider the Bird Cherry a native?

Mr. Smith. Yes; I found the Bird Cherry bearing in Wabasha County twenty years ago.

A Member. What time would you transplant trees that are ten to twelve feet high?

Mr. Smith. I would move them just as the terminal buds were swelling, in the spring.

President Smith. That is the right time for trees ten to twelve feet high, but in transplanting trees that are twenty-five or thirty feet, you want to take them up in the winter with a bunch of dirt. Moving with a pile of frozen dirt is all right, but it is very hard work, and it is expensive.

Mr. Bunnell. I was talking to a gentleman last night about moving trees; he said he moved some in the winter, set them in the holes, and every one of them died.

Mr. Smith. More than that, they should be heavily watered, when they are set out. They should not be allowed to stand long from the

time they are taken up. A man going into that must provide some fresh dirt that isn't frozen, and put on plenty of water.

Mr. Pearce. Mr. President, there is one objection that I have to setting large trees. Unless they have been transplanted two or three times, it is impossible, if they are very large, to get them to do well. There are not roots enough. In ninety-nine cases out of a hundred the internal part will be dead while the sap is alive, and as soon as you check the growth of the elm or boxelder, or any of these shade trees, the borers will set in; the moment the heart of the tree is dead the borer sets in. They have destroyed more trees than all other causes put together. Whoever advocates setting large trees makes a great error; that is, speaking of shade-trees. By taking them up in the winter one may accomplish something. Where a tree has been transplanted two or three times, if it is four inches through, it is as sure to live as a seedling an inch thick. But I speak from experience in saying it is almost sure death to transplant large trees. They tried it in Rochester; and I think the gentlemen of this city have found it so. A small tree, a one-inch seedling, is as large as a person should ever set. And when it comes to evergreens, I never want to set an evergreen that is over three feet high. You may set one of these large ones and in order to make it live, you must cut off the large limbs and the lower limbs. A small one retains all these limbs, and makes a symmetrical and beautiful tree. The hard maple I believe is one of the handsomest trees we have, but at the same time, if set where it is liable to be tramped and the leaves gathered and burned, it is almost certain to die. A friend of mine at Lake Minnetonka had a fine grove of hard maples. He trimmed out the dead limbs, cut out the old trees, burned the leaves and tramped the ground; and he said to me, "Pearce, why is it the hard maples all die, the top of every one is dead?" Said I, "You take the life out when you burn the leaves." If you put the hard maple where the surface of the ground would always be covered with leaves, it will live as long as any tree. The roots of a white oak tree run down, and you can never kill them by tramping.

Mr. Harris. I have a different opinion as to tramping not killing the white oak; I know that tramping is very fatal to the black oak; I have known them to be killed by cattle tramping around them.

Mr. Pearce. Those were the red oak?

Mr. Harris. Yes, and the black oak, on my own place.

Mr. Elliot. Speaking of lawns, I think Mr. Smith has allowed a pretty liberal amount of blue grass seed and clover for seeding.

Mr. Smith. I guess that is pretty large.

Mr. Elliot. Instead of ten pounds of clover I would only use about two. The finest lawns we have in this city are made entirely with blue grass. Many have come to me wanting to know why their lawns died out. It is because they throw out their slops and dirt on them, and keep them filthy. If they would give them protection and run over their lawns regularly every night they could keep them looking well.

Speaking about transplanting trees, I think Mr. Pearce is right in regard to transplanting very large ones. I have been in the habit of transplanting trees all the way from six to twelve inches through and twenty-five feet high. Such trees, if taken up with a pile of dirt, and handled properly, one may succeed in making live; but if one takes up a tree ten to twelve inches through with a pile of dirt four feet square, exposing that pile of dirt to the air for one month before setting, what can you expect! You will have a pole the next year without any foliage on it. Our park commissioners have been criticized this evening with regard to the planting so largely of elms. Now, I happen to know why they planted so many, and the reason was they could not get other trees that were suitable. They sent to Illinois to get those elms. They hunted all over Minnesota for them first. There were no trees of that description here. They got trees from two to four inches through. Those trees when they came out of the cars had a mat of fibrous roots. They were shipped the same as to-night and to-morrow they were here, and the next day they were hauled away and proper care taken of them. Out of all those trees, I don't think they have lost three to a hundred. I know at our park they have only lost four trees. They have the maple, the linden, elm, ash and boxelder, and they are all doing well. It is because they have been nicely handled. And that is the secret of planting trees; it is in the handling.

Mr. Smith's idea of taking out a cubic yard of earth in transplanting large trees is a good one, but if the soil is very sandy it should be four times that. I have been somewhat amused to observe our people where they have been cutting down their streets take off all the surface soil, haul it off to fill up some hollow, and leave nothing but a sand pile on which to plant their trees. They go and dig out a bushel or two of dirt and plant the tree. You may expect the tree to live the first year, the next year begin to look sickly and about the third year die. And they then wonder why it is dead. Well, if we were to take our children and give them the same fare, I don't think we would raise

many of them. I have been making a practice of cutting down and digging a hole ten to twelve feet broad, and three to four feet deep in which to plant my trees. Then it has something to feed on. The roots will extend under the street, and it can run up into the lawn and get feed there. I think if we looked at this idea of planting trees in a common sense way, we wouldn't have so many failures. Five or ten feet across and four feet deep is the way I want it fixed on the street.

I don't know of anything that has interested me more than this paper. I would say it is about as correct as anything I have seen for the treatment of street and lawn planting. We have given this subject too little attention. Heretofore we have devoted the large proportion of our time to the apple and other fruits, and I am glad to see that we are coming back to our senses and trying to ornament and adorn our homes and make them pleasant and beautiful.

Mr. Smith. I am sorry the paper is not better, but having read in one of the reports what Mr. Pearce said in regard to the hard maple to the effect that for all the shade trees for planting in Minnesota there was nothing equal to the hard maple, I had rather expected a little more endorsement from him.

Mr. Pearce. Well, gentlemen, there are a good many strange things in this world after all. That was in regard to planting hard maples for a sugar plantation; but I will say to-day that if you want shade trees on the prairie and want something very nice, you will get ten thousand of those little hard maples, at about two dollars a hundred, in place of putting in the cottonwood, plant them on ten acres of ground and afterwards you will thank me for it.

Mr. Elliot. I don't think you can plant any tree with a large leaf on the prairie, and expect it to live. Even the boxelder won't live, nor the ash, and all those kinds of trees outside the willow and cottonwood, you may just as well give up trying to grow, first as last.

Mr. Pearce. Those little hard maples, a foot high, planted thick, say a foot apart, will grow. I set them seven years ago at Moorhead, and I could go there now and show you the handsomest grove there is in that whole country.

Mr. Barrett. In the locality in which I live we make a success with the boxelder; we can abuse that tree more than any other and have it survive. The Minnesota Pine is a failure. I have tried it three years. The lombardy poplar is very unpopular with us, also the white poplar, and the silver leaf. On the level ground it seems to blight, and the tree dies. There are certain influences at work there

that would apply in this locality. One Minneapolis gentleman speaks of us out west as if we were as much advanced in these methods as you are here. We don't claim to be behind the times otherwise, I guess we are abreast, but in this matter I do not think we are. But we have to contend with those terrible winds where a man can hardly stand up, and yet is obliged to work and travel. Doubtless that accounts for the fact that a great many of our people do not make these things a matter of study; and while they are not indifferent to these things they do not study to understand what they ought to do, and they fail, in a measure. We have made a success in growing the boxelder and the white elm. We are succeeding to a limited degree, with the Norway Spruce and Scotch Pine; the Austrian Pine is a failure. I can give very few instances, indeed, where they have succeeded at all. One of my neighbors living in the vicinity of the town had quite a variety of evergreens. He set out a large quantity of them; I think about a quarter of them are alive. Last summer a gentleman representing some eastern nursery was through our locality with a large quantity of evergreens, beseeching our citizens to buy. They did buy. They asked me my opinion. Said I "They have got to die." And my prophecy proved true. There is just one solitary tree that is still alive, which may possibly live through the winter. The Hackberry is a perfect failure with us.

Mr. Smith. Perhaps it is better to substitute White Pine for Scotch Pine. But in making a success or a failure of these things it is a good deal in the man. Mr. Elliott, won't you please tell us that story of your trip to Duluth for evergreens; tell us how many you got, how long it took, how you handled them, and how long they lived?

Mr. Elliott. I have told it so many times it has got to be an old story. I think it was thirteen years ago, I started from here on the 29th day of May, and went to Duluth. The way I happened to go there was, the year before I went up there and while wandering around I saw a nice chance back of the bluff for getting a few *Arbor Vitae*. Also I noticed a swamp, at Moose Lake station, where there was any amount of spruce. I was also acquainted with a man at Superior City, that had dug some trees and shipped them, and there was a swamp of white spruce near there. I started on the 29th of May, in the night, got to Duluth the next morning about six o'clock and went to the hotel. Breakfast was not ready, and I thought I would take a little stroll up on the bluff. After a little I went back and inquired where I could hire a man; I found a man to help me, and we

went up there, and with our hands we pulled out the trees putting them into bundles and packed about twenty thousand Arbor Vitae during the day; at six o'clock at night I had them on the train. I came down to Moose Lake station, switched off there for the night. The next morning we hitched to a hand-car, got a man to run me up to the swamp, where I got about three thousand balsam and spruce; arriving home with the trees the next morning. I had over twenty thousand trees. Instead of planting those trees as many do when they get forest trees, I placed them just as close as I could, right along in rows, about four or five inches apart; some of them were three or four inches, and from that up to a foot high. We kept them in water all the time, and after they were packed in that shape, we drove stakes in the ground, had strips of boards and poles fastened or arranged in such a manner as to keep the trees moist all summer. I let those evergreens stand there for two years. When I transplanted them I didn't lose five per cent. I have some of the trees out here at my place, that are fifteen to eighteen feet high. Some of the Arbor Vitae that I got are left yet, five or six feet high, and are nice evergreens. That is the way I handled them, and that is the way I got them.

President Smith. I wish to say in regard to transplanting large trees, that I do not advocate the setting out of large evergreens; while it can be done, I certainly would set small trees every time, of both the deciduous trees and evergreens.

On motion, the meeting adjourned until Thursday morning at nine o'clock.

THIRD DAY.

THURSDAY MORNING, January 21, 1886.

The meeting was called to order at nine o'clock by President Smith.

The Annual Report of the Secretary was then read:

THE SECRETARY'S ANNUAL REPORT.

Mr. President and Fellow Members:

In presenting this our first annual report as Secretary of the Minnesota State Horticultural Society, you must be congratulated upon the very auspicious circumstances that surround us, not only as members of this Society but as citizens of this great and growing commonwealth: upon the material advancement and prosperity which have characterized our labors, and the goodly degree of happiness which it

has been our privilege to enjoy. We have been favored with fruitful seasons; abundant harvests of wheat and corn, and been provided with bountiful supplies of choicest fruits of nearly every character and kind. And while other lands than ours have suffered in notable instances from the ravages of war, famine, or pestilence, we as a people have been favored with the blessings of peace, prosperity and plenteousness. Losses from heavy storms, disastrous floods and destructive cyclones have happily been averted within the borders of our own State during the past year, and there are abundant reasons for heartfelt gratulation to the Giver of all good for the many blessings that have been bestowed upon us.

It is a fact well understood that the larger portion of the people of Minnesota are engaged in agricultural pursuits and that the farming industry lies at the very foundation of our wealth and prosperity. And while it is true that those engaged in other avocations contribute their proper share, still to the well-directed efforts of the farming classes are we mainly indebted for the real progress made in a material point of view.

The staple productions of Minnesota are chiefly those of the farm, consisting of wheat, corn and other cereals; of cattle, horses, hogs, etc., the combined value of our products for the year 1885 being considerably more than eighty millions of dollars. There has been marked advancement in some departments of farm labor within a recent period, which may be cited as an indication of the progress being made; as for example that of dairying, which as a leading industry of the State, has grown to vast proportions within the last five years.

No one will question the statement that our people in the pursuit of their various occupations are as a rule, active, earnest and wide-awake; and it is no exaggeration to say that our industrial classes are generally intelligent, practical and thorough going in their work and several callings. This is, perhaps, but natural and almost necessarily the result in such a climate as that which Minnesota affords, where the atmosphere is so remarkably pure, bracing, exhilarating and healthful; where our summer seasons are comparatively short, and the growth of vegetation in many instances so remarkably rapid and luxuriant.

But while no one will question or deny the rare fertility as well as great productiveness of our Minnesota soil, it is also a fact which cannot be disguised that there are certain disadvantages, or drawbacks to be contended with which need to be most thoughtfully considered by our best statesmen, by every toiling farmer and laborer as well. One thing to be deplored is unremunerative prices which prevail for various commodities here produced, denying to the husbandman an adequate return for labor necessarily bestowed. We come in competition with foreign grain because of low rates of transportation by rail and by ocean steamers. Russian and Indian wheat find ready market at leading seaports of the western world, and at the same time statistics indicate that our production of the cereals is steadily increasing. As one result of this condition of affairs, farmers throughout the State are now diversifying their industries to some extent, instead of growing and depending wholly upon one leading, staple article, that of wheat. They are directing their attention to stock raising and dairying, and other methods of diversifying their labor. The measure of success attending this new venture has thus far proven quite satisfactory. There is, however, need of further change, for we must recog-

nize the need of growing our own fruits; we must as far as possible supply our luxuries and our necessities, here at home.

OUR NATIVE FRUITS.

I scarcely need remind you of the fact of the superiority of our home grown fruits as compared with products shipped us from the southern states and warmer latitudes. No finer flavored grapes, or strawberries, are produced than such as are or may be grown in Minnesota in great abundance, with proper care or skill. As yet, but little has been done in this direction. We cannot half supply our local markets now as we may do when we have learned the best and cheapest method of care and cultivation. In this regard to educate, point out, and recommend the wisest plans to be pursued, should be the mission, aim and work of our Society, at least to more or less extent.

There is no doubt that horticulture in our State has heretofore been characterized with failures, difficulties, and losses of various kinds, well nigh sufficient to try the stoutest heart, and not a few perhaps at times have been discouraged; but there is room at present for hope of better things and brighter days to come. The work of this Society, perchance, will not be labor lost, or spent in vain. Those members who have all these many years been planting trees, experimenting and testing various fruits, will not give o'er the struggle yet awhile; we trust their fondest visions in the past may yet be realized at least in part.

STATISTICS.

According to the reports of the State Commissioner of statistics the number of apple trees growing in the State in 1884 was 779,699; in 1885, 789,080; in bearing in 1884, 301,455. The number of bushels of apples produced was 36,082 in 1874; 52,555 in 1875; 64,538 in 1876; 75,736 in 1877; 89,922 in 1878; 124,261 in 1879; 147,903 in 1880; 158,058 in 1881; 176,038 in 1882; 180,736 in 1883; 173,357 in 1884. It will be seen that the number of bushels reported has steadily increased from year to year, but is in the aggregate far disproportionate to the amount which should be annually produced. The same report returns the number of bearing grape vines in the state in 1884 at 75,334; in 1885 80,352; number of pounds of grapes produced in 1883 at 152,678, and in 1884 the amount returned was 259,404 pounds.

The counties in the State which in 1884 report above ten thousand trees in bearing, are: Carver, Dakota, Fillmore, Goodhue, Hennepin, Houston, Le Sueur, Olmsted, Rice, Wabasha, Winona, and Wright. Fillmore county reports the largest number of trees in bearing, being 25,379, with Olmsted county next, reporting 20,378 bearing trees.

The largest productions of grapes was reported from the counties of Hennepin, Houston, Ramsey, Wabasha and Winona. The number of pounds of grapes reported from Hennepin county, for 1883, was 32,295.

Now, this exhibit plainly indicates that raising fruit in Minnesota has not as yet become a leading industry; and it suggests the pertinent inquiry how shall we measure up and reach the wished-for standard? Have not the people been too lax in this regard?

SMALL FRUIT CULTURE.

While it is true that orcharding has been neglected to some extent it may be

said that *small* fruit culture has rapidly developed, and those who claim to know whereof they speak affirm it pays a liberal return. We have no accurate data concerning just the quantity of berries raised in Minnesota, suffice to say, the quantity of strawberries alone, produced in 1885, was several times as great as that of three to five years since. The little patches planted here and there have grown to acres in many instances, producing large and paying crops of luscious fruit which finds a ready market here at home.

In this connection it may be proper to inquire if this Society should not give some attention to the discussion of all the various methods to be used in order to encourage and promote this profitable and pleasing industry—the cultivation of small fruit.

THE PAST YEAR

In some respects has been a trying one; perhaps the most disastrous to fruit trees ever yet experienced. The losses are, however, not confined to northern latitudes. Fruit growers hundreds of miles below the southern limits of our State are bitterly complaining. Reports that reach us from Ohio, Illinois, Iowa, Wisconsin and other states would seem to indicate that losses have been great in all these different sections. For example, an estimate of fruit trees in northern Illinois, reported as dead or in a dying condition, presents the following result: apple trees, 56 per cent; pear trees, 65 per cent; peach trees, 95 per cent. This somewhat new and phenomenal experience has disarranged to some extent the well-established theories entertained and put in practice heretofore, concerning hardiness and ease of propagation of certain kinds of standard trees. But while with us there may have been a greater loss of apple trees than heretofore, it also may be said that this result was not entirely occasioned by the extremes of cold experienced last winter, when the thermometer in some localities at times, perhaps, dropped down among the fifties. It is believed by some that the continued warm and almost sultry weather experienced before the cold set in had more to do with the loss of trees than any other cause. Some instances are mentioned where trees were out in bloom just at the time when properly they should have been in good condition to enter "winter quarters."

As to how far exposure, improper methods of protection, heat and cold, diversity of soil, as well as lack of proper care, or cultivation, have each or all conspired to bring about the loss referred to, we leave with others to determine; suffice to say we must again revise our systems, plans and modes of culture, if we are ever to succeed in growing fruit. The lessons of the past remind us surely it is no "royal" road that leads on to fortune; we need to marshal all our forces and bring to bear the best experience, the highest measure of intelligence and skill. The very general loss of trees experienced should not discourage wholly nor cause us even to relax our efforts in the least. Of course the chances lessen, and difficulties in the way are much increased, where such extremes of temperature are found; where drought and scorching heat prevail to some extent in summer; where heavy winds and storms some times are felt. And yet, despite these drawbacks may we not pursue a course which in a measure will enable us to overcome them and gain an ultimate success at last? It is a vital, all-important question whether we shall give the battle o'er or fearlessly press on to meet and overcome the obstacles which

seem to block our progress and partially hedge up our way. We scarcely need to call attention here to what has been accomplished, or bring to mind the tedious processes by which we have secured the present vantage ground. You have felt well the value of

OUR MINNESOTA SEEDLINGS AND SO-CALLED "IRON CLADS."

It would be difficult to estimate the time and money spent originating healthy, hardy trees, and such varieties as would withstand severest tests of every kind, and still afford us fruit of pleasing quality, of proper size and keeping merits. In this regard we have not yet attained our object fully although much progress has been made. The merits of our Wealthy apple are much extolled abroad: we proudly point to that and many other home-grown sorts, of less or greater promise. But still it is an open question how far we may succeed in propagating Minnesota seedlings, a subject well deserving close investigation upon the part of all, and one which may elicit much and profitable discussion at this session.

RUSSIAN VARIETIES.

We wish to call attention briefly to the subject of the propagation of Russian varieties of apples, and to review the testimony, to some extent, for and against their introduction. It seems to us this is one of the most important subjects which can be brought before this meeting for our consideration.

Much interest has been shown of late, by many persons in gaining all the information to be had concerning the adaptation of these fruits, both to our soil and climate. The merits of the so-called new Russian sorts, have been unduly magnified by some, while they have been condemned upon the part of others. All the discussions on this subject have taken a wide range; we cannot stop to give more than a passing notice to what has recently been said and written in regard to introducing Russian fruits. It would seem quite important at this time, however, that we should carefully examine upon the evidence, pro and con, in order that we may determine what the true facts are in the future and act accordingly.

Upon this subject of the comparative merits of Russian varieties of apples, we may refer to the discussions had at the annual meeting of the State Horticultural Society of Ohio in 1884, where the question of "practical experience with Russian apples" was under consideration. It was contended on the part of some of the members of the society that for the climate of Ohio, and especially as far as the fruit growing regions of the Western Reserve were concerned, that the growing of Russian apples was unnecessary. Others took the position and argued strenuously in favor of planting and giving them a thorough trial. It was claimed that in central Ohio they had withstood the storms, snows and frosts for ten years past, without material injury, where many orchards were producing thousands of bushels of these apples, as fine as are to be found in the market, while at the same time many of the leading native varieties had been entirely destroyed.

Mr. Saunders, president of the Ontario Fruit Growers Association, and Mr. Besdie, a member of that society, being present, took part in the discussion referred to, and were called upon to relate their experience with Russian apples in Canada.

President Saunders said: "Our purpose in introducing the Russian apples is not to give them to the people who can grow the better apples; but to those only who reside where the common varieties will not succeed: and I can easily understand

that the large dissemination of Russian apples among your people of Ohio is more likely to result in injury than benefit."

Mr. Beadle stated that his observation and experience had taught him to make haste slowly in propagating Russian apples and not to embark in the enterprise by the wholesale. Where such standard apples as the Baldwin, Ben Davis, Rhode Island Greening, the Russet and other familiar varieties could be grown, there was no occasion to make a change, they were more highly flavored, more valuable in every way than any of the Russian apples that he had seen. So far as his observation had gone they were not as highly flavored as the American apples. He recommended, however, the growing of Russian apples in portions of that state where the summers are dry and very hot, and the winters are cold and dry. Among the varieties which had succeeded well in the vicinity of Ottawa, he mentioned the Alexander, Red Astrachan, Duchess and Yellow Transparent. In this connection he mentions the Wealthy as being originated by Mr. Gideon, of Minnesota, and a variety that had succeeded well with them, and thought it would take the place of the Baldwin in places where that variety would not grow abundantly.

Mr. Allough, a nurseryman, who had had twenty-six years' experience in the Miami Valley, stated that there were more fruit trees grown in that valley than in any other diameter of twenty miles in the world, and that the Duchess succeeded there first rate, also Yellow Transparent, for an early variety. He advised planting plenty of the new Russian varieties, as they withstood the rigors of the climate when the old varieties would not.

The fruit growers of Kansas seem quite averse to recommending Russian varieties of apples, judging from action taken by the Horticultural Society of that state. At the semi-annual meeting of that society, held in June, 1884, a resolution was adopted to the effect that none of the Russian apples are worthy of cultivation, except the Duchess, Red Astrachan and Tetofsky, which should only be planted sparingly for family use. One speaker quoted Prof. J. L. Budd, of Iowa, one of the very best authorities upon this subject, as having written him as follows: "Where such fine apples of the American varieties grow and bear such fine specimens as they do in Kansas, don't trouble with the Russian varieties."

At their annual meeting in December 1884, a resolution was offered that, in the opinion of the society, all the Russian varieties of apples are unworthy of general cultivation in Kansas and should be stricken from their voted fruit-list; and that report indicates the adoption of the resolution by a vote of 17 to 5.

The brief report given of discussions upon the foregoing resolution indicates a purpose on the part of the society to defeat the efforts of the swindling tree peddlers rather than to condemn the introduction of true Russian fruits.

Mr. Custer, of Junction City, in opening the discussion, contended that great damage had been been done to the fruit interests of Kansas, by the sale of hundreds of thousands of comparatively worthless Russian fruits at extortionate prices. He referred to the "smooth-tongued tree peddlers" who, usually being strangers from abroad, are compelled to work, steal or starve; and who sometimes are wont to choose a half way course between the first two. He argued to show from this standpoint a doubt or positive denial of the value of the Russian fruits for Kansas. He refers to a statement by E. J. Teas of Dunreath, Indiana, who writes under date of November 1884. "There is not one of the Russian varieties of apples

tested in this State, or so far as I know, in the Union, that has developed qualities that entitle it to pre-eminence. I believe the best are the Duchess and Red Astrachan, and possibly the Alexander." He refers also to a letter received from Elwanger & Barry, of Rochester, N. Y., under date of November 29th, 1884, in which they say: "We have fruited a great many of the Russian apples so-called. This season we have Peter the Great, Titorka, Ananasnoe, Belborodoskoe, Arabskoe Kapsnoi, Limnoi, Antonooka, Ostrowskoe, Tschence, Drewe, Nicolager, Anise, Nova, and others. Some of these are fruits of great size and fair looking, but we have not had experience enough with them yet to be able to say whether any of them will be valuable keepers; we are inclined to think not, here. They may be of value in severe north and northwestern climates. We must give them a fair trial." Mr. Cutter concludes his paper by adding: "Therefore we have no room to hope for anything from Russia but a lot of summer and fall cooking apples."

In Iowa the value of Russian varieties of apples has been brought before the meeting of the Horticultural Society of that State from time to time and many interesting facts elicited. Mr. Van Houton, of Bedford, in an able paper on orchard management, says upon this subject: "The unqualified reliability of the Duchess and the high promise of other Russians renders it certain that we will get many profitable varieties for general planting all over Iowa, but the introduction of the newer kinds is in the hands of experienced Horticulturists, and the beginner should await their decision before planting and avoid buying of glib-tongued tree peddlers, fancy-priced Russian varieties." The experimental grounds at the agricultural College, under the careful management of Prof. Budd, with the experiments under way by our best Horticulturists will bring to the front the best."

President Speer, in his annual address before the society, observes "A careful examination of the wood or cuticle which covers the bark and the bud-scales of the Duchess and other truly iron-clad trees will show that they have been designed to guard against vitrefaction in a very cold, dry climate. Many of the Russian varieties of the apple, cherry, etc., have such qualities and also have thick leaves which have a greater number of empty guard-cells on their upper surfaces than the smaller and thinner leaves of American and west European varieties."

Upon this subject we may cite one more authority, referring to the report of Mr. Havaland, of Fort Dodge. In speaking of extreme climatic changes and the severe cold experienced in that locality, he concludes that a favorable opportunity was offered for a comparison of the endurance of Russian and native varieties, and adds: "judging from the color of the branches of last season's growth we find the following numbers compare favorably with the Wealthy and Duchess: 367, 153, 8, 323, 402, 369, 563, 98, 206, 48, 167, 181, 177, 181, 333, 418; and the following not as hardy as the above, are about like the Haas and Yellow Transparent; 10, 371, 164, 183, 467, 382, 202, 393, 378, 874, 277, 12, 290, 230, 856, 399, 4, 128, 122."

I will not trespass upon your time further by citing the opinions advanced by fruit growers in Wisconsin and our own State who have had practical experience in growing Russian fruits. We hope to get a very fair expression of their views at the present meeting, and trust that they may furnish the added weight of experience gained during the past year, when conditions have changed so very materially in many instances, in regard to the propagation and growth of fruit trees of every kind.

EXPERIMENT STATIONS.

Mr. President, I trust this meeting will not adjourn without action being taken looking to the establishment of some definite plan whereby the members of this Society and others may be enabled to receive the benefits to be derived from actual experiments made from time to time by practical horticulturists; that proper plans may be devised and provisions made, whereby not only theoretical but practical horticulture may be promoted in this State. I refer, of course, to experiment stations and the character of the work to be undertaken and thereby carried on. The efforts heretofore put forth in this direction have been effective for the objects had in view and much has already been accomplished, but there is need of more systematic effort being made and better methods being used to make these stations all that could be wished.

Upon this general subject I would call attention briefly to the matter of agricultural experiment stations as showing what is elsewhere being done in this direction. Prof. S. A. Forbes, at the annual meeting of the Illinois State Horticultural Society, in December, 1884, presented a report to the Society in which he says: "Agriculture has been preeminently esteemed by all civilized nations from the earliest times, because it is recognized as the foundation of wealth and progress. It has also been favored by governments because the art is essentially experimental in nature and practice, and the benefits of the experiments reach the whole people, rather than enrich the individual. As the processes of agriculture become scientific and rational rather than empirical and traditional, the value of experiment and investigation becomes recognized and new knowledge is not only tolerated but is more and more sought for by practical men."

Reference is made in this report to the valuable investigations made by Boussingault, of France, and to those of Justus Liebig and others, of Germany, in the earlier portions of the present century.

The first agricultural station regularly established in America was in the state of Connecticut in 1875, since which time stations have been established in North Carolina, New Jersey, New York, Massachusetts, Ohio, Wisconsin and California.

In 1877 the Connecticut station was permanently established in connection with Sheffield school, a department of Yale College, and an annual appropriation of \$5,000 made for its support, which was increased to \$8,000 per annum in 1882. The most prominent work of the station has been the analysis of commercial fertilizers sold in the state. It is said that very great improvement is attributable to the work of the station. Bulletins are issued from time to time showing the results of experiments made in testing seeds, the physical properties of soils, the relative value of foods, etc.

In North Carolina the experiment station was established in 1877 and about \$7,000 is annually expended. The work of the station is mainly devoted to fertilizers and soils, but attention is also paid to seeds, feeding-stuffs, waters, rocks, etc.

In New Jersey the station was founded in 1880, in connection with Rutgers College, the sum of \$11,000 being annually appropriated by the legislature, while the college furnishes the laboratory and other necessary buildings. Most attention has been given to the analysis of fertilizers, but much to feeding and field experiments.

The New York agricultural station was founded in 1881, a state appropriation being made of \$25,000 for land and buildings.

In Massachusetts the station was founded in 1882, \$5,000 being annually appropriated. It is located at Amherst, the laboratory and about eighteen acres of land being furnished by the college at that place. Among subjects of investigation are fertilizers, plant diseases, stock feeding, insects, etc.

In Ohio the experiment station was established at the State University in 1882, \$5,000 per annum being appropriated for expenses. The experiments both in the field and laboratory deal with grain raising, stock raising, dairying, horticulture, forestry, etc. Bulletins are prepared for the agricultural press and annual reports are printed at the expense of the state.

In Wisconsin the experiment station was established in 1883 and connected with the State University. The farm, consisting of 125 acres with barns, dairy, fruit plantations, etc., which belong to the department of Agriculture of the University, are all at the service of the station. About \$6,000 are annually expended. The scientific corps of the station consist of the professors of agriculture, botany and chemistry, with one assistant. Bulletins are published from time to time and annual reports made at the expense of the state.

In California the experiment station is supported by direct provision of the legislature and is connected with the agricultural department of the State University. About fifteen acres of the University farm are used, and about \$7,500 have been expended in fitting up the grounds and the laboratory. Attention has been given to the analysis and classification of soils, irrigation and to viticultural investigations. Annual reports are made and weekly bulletins sent out to the agricultural press.

In Georgia a small experiment station has been established at Athens, and grounds have been purchased and fitted up at an expense of \$30,000. Chief attention is paid to cotton and cotton growing.

As to what is being done in this line of work in Minnesota I refer you to the very interesting report of Prof. E. D. Porter, in charge of theory and practice of Agriculture, at the State University, and superintendent of the State Agricultural farm.

In the report alluded to Prof. Forbes defines the agricultural station as "An agency intended to determine the conditions of the best success in agriculture under existing circumstances, applying to the numerous and complicated questions involving the strictest methods of modern science, and putting the results arrived at in so clear, definite, and exact a form that no intelligent farmer can fail to comprehend them, or refuse to acknowledge their force. It substitutes skill, method, accurate record, elaborate scientific experiment, for the irregular, indefinite, uncertain, inaccurate, hap-hazard individual method of agricultural observation and experiment now generally prevalent."

What has been said upon this subject would seem to indicate the necessity as well as utility of experimentation, not only in departments of agriculture in general but also in horticultural work and investigation. In this age of wondrous inventions, important and often startling discoveries, we want more specialists,—those who make a particular subject a study, and who, after becoming thoroughly informed themselves, may readily impart information to others.

If the State of New York can annually appropriate and expend the sum of \$20,000 for judicious and profitable experiments to be made by their agricultural station may there not be need of provision being made for corresponding work in Minne-

ota? And, further, should not something be done each year by this Society and its executive board, to aid in experimental work?

Among possible lines of investigation which might be named are, protection from contingencies of climate; the effects of drought; averting injuries from scorching heat, from storms in summer and disastrous frosts in winter; originating new varieties of the hardiest, healthiest and best kinds of fruit trees, plants, flowers, vines and shrubbery; (casting out the worthless and unworthy,) studying the nature of plants, their diseases, their acclimation and methods of cross-fertilization; the habits and influence of insect life upon plants and fruits, and carefully noting the results.

It may be said and to the credit of this Society, that its officers and members are deeply interested in the work which they have undertaken. They recognize the nature of the multitude of difficulties to be met and overcome. The record made already in the past in many aspects is a cheering one, and better things are hoped for in the future. In order to avoid mistakes and make substantial progress in the work we have in hand we want united action; our methods need to be both practical and plain. We seek to gather information everywhere and profit by experience, time and labor spent by kindred state and local organizations similar to our own.

LOCAL HORTICULTURAL SOCIETIES.

As indicating the increasing interest taken in horticulture in this State, it is but proper to refer to what is being done by local organizations. Of these societies there are quite a number in existence, and doing a good work. One new society has been established recently at Granite Falls, and it is gratifying to observe the progress being made in various portions of the State in active, earnest, thorough work. Without designing to repeat or in the least infringe upon the very interesting report already handed in, we wish to call attention to the very creditable record made by the Hennepin County Horticultural Society and Gardener's Association, and more especially in connection with its second annual fair. This organization has but recently been founded (that is a couple years ago,) but has already gained deserving fame abroad. There is no question that it is accomplishing much which will be of lasting benefit to its many members as well as others, by its experiments, its meetings and discussions and various methods used and recommended. In this connection, as showing what is being done, we quote the following, taken from the St. Paul Pioneer-Press, descriptive of the opening of the second annual fair, occurring September 22, 1885:

A REALLY SUPERB DISPLAY.

The second annual fair of the Hennepin County Horticultural society and Market Gardeners' association opened yesterday at the new Brackett block, corner of Second street and First avenue. As is usual on such occasions, the first day was really devoted to the arrangement of the various exhibits, but enough were in place last evening to prove that the fair is the most successful of its kind ever held in the county, and the display of fruits and vegetables surpasses that witnessed at any meeting of the State Horticultural Society. The grape exhibit alone occupies a table at least three feet in width and seventy-five feet in length, the major portion of which is credited to the intelligent and enterprising horticulturists residing along the shores of Lake Minnetonka. Perhaps the largest single exhibitor is Mr. A. W. Latham of Excelsior, who has no less than thirty distinct varieties of grapes on the table. He has a vineyard covering eight acres, five of which are bearing, and as one gentleman expressed it, "There are not weeds enough in the vineyard to fill your hat." The moisture and sandy soil of the lake

shore are pronounced exceptionally favorable for the culture of the grape. Mr. Latham's testimony being that the fruit produced is as good as can be grown in the United States but some varieties do not find the season long enough for complete ripening. Certainly the display at Brackett's will more than sustain the above opinion, and shows that Hennepin county has not more than fairly commenced the development of one of its numerous sources of wealth. N. J. Stubbs of Long Lake exhibits thirteen varieties of grapes, including the "Rogers No. 89," a prolific bearer, ripening early, and with a flavor which cannot be surpassed. Mr. Stubbs states that his grapes have yielded at the rate of \$400 per acre each year since he has been engaged in the business. Mr. J. Bost of the same place has fourteen varieties on exhibition, three of which are new, and among the latter the Lady Washington and Jefferson being specially prized on account of their beauty, fruitfulness and the compact and solid character of the individual bunches.

THE DISPLAYS IN GENERAL.

In the department of grapes, apples and other fruits, F. G. Gould of Excelsior makes exhibits which will reflect credit upon any state; including nearly all the varieties of grapes to be found in any latitude or country. Exceedingly fine collections of grapes are also exhibited by J. S. Harris, La Crescent; N. H. Reeves, Minneapolis; J. J. Cale and Charles Gibson, Minnetonka; H. F. Busse, Minneapolis; T. Bost, Excelsior, and G. H. Roberts, Minneapolis. N. J. Stubbs of Long Lake and F. G. Gould of Excelsior are competitors for the \$50 prize offered for the best and greatest variety of grapes. In the department devoted to apples, the destructiveness of the extreme cold last winter is fully revealed. The display is not extensive in quantity or variety, but the quality of the specimens exhibited is excellent without exception. There are only eight entries in this department, as follows: K. H. Whipple, Chowan; J. S. Harris, La Crescent; J. J. Cale, Minnetonka; Charles Hawkinson, M. V. Pratt, J. T. Grimes, H. F. Busse.

AMONG THE VEGETABLES.

The display of vegetables is very full and complete, and a better is seldom witnessed. The gardeners of Hennepin county state that the series of meetings and discussions held during the past winter and spring are reflected in the improved character and greater variety of garden products cultivated during the past summer and now placed on exhibition. Several new seedlings of unusually promising character are displayed in the various departments, all indicating that the horticulturists and market gardeners have entered upon investigations and experiments which promise great and profitable results in the near future. The principal exhibitors in this department are:

G. H. Roberts, Minneapolis; K. H. Whipple, Chowan; J. F. Gilmore, Richfield; Nicholas Hermes, St. Paul; John Lyons, William Lyons, N. H. Reeves and John Hogan, Minneapolis; A. N. Grady, Minnetonka; H. R. Samplugh, Minneapolis; E. Peteler, Shingle Creek; J. T. Woodman, Brooklyn Center; Frank Moeser, Minneapolis; J. J. Cale, Minnetonka; Eli Anderson, Northome, Lake Minnetonka; Nicholas Demuth, Chowan; C. F. Baston, J. J. Baston, M. V. Pratt, J. T. Grimes and Charles Hawkinson, Minneapolis; M. A. Dean, Shingle Creek; J. F. Held and Richard Gray, Minneapolis.

H. F. Busse and John Lyons of Minneapolis are competitors for the premium offered for the greatest and best display in this admirably filled department.

THE POTATO DISPLAY.

There is also a fine display of this common but exceedingly useful vegetable, the principal competitors being G. H. Roberts, H. F. Busse and William Lyons, Minneapolis; J. F. Gilmore, Richfield; A. N. Gray, Chowan and E. Fettler, Shingle Creek. Mr. Roberts exhibits five different specimens of winter and spring; Mr. Gray eight varieties and ten seedlings, and Mr. Lyons' exhibit was not surpassed at the late state fair.

In the class of canned fruits and vegetables the displays are not numerous, the principal exhibitors being M. V. Pratt and Mrs. Mary Lyons, Minneapolis, and Mrs. M. A. Pearce, Minnetonka. Messrs Northrop, Braslan & Co. have an extensive collection of bulbs on exhibition, including different varieties of tulips and double hyacinths, and seeds of all kinds may be found in their tastefully arranged department. The arrangement of the exhibit was not fully completed until last evening, and those who visit the fair to-day will be convinced that the soil of Minnesota can produce its quota of delights, and that beauty, life and wealth are concealed under its fair surface.

It seems to us that something should be done for the encouragement of horticultural work, such as is being carried on by these societies. It takes some time

and money to hold an annual fair, at least the kind above described. Where liberal premiums are paid to those who make exhibits, it is no more than just that the society should have some adequate encouragement and support, the same as local agricultural societies are now supported by the State. A small appropriation from the State would prove of much assistance in holding horticultural fairs.

It may be proper to consider whether this Society cannot materially assist these county organizations in some substantial way. There ought to be a mutual interest felt in the prosperity of each and all. Perhaps some plan may be devised for cultivating still more intimate relations. We recognize the need of their co-operation and support, and we in turn must do our part since all our interests are so reciprocal.

THE ANNUAL REPORT.

The thirteenth volume of this Society's transactions was issued in the month of June. It was received with favor, but published at a season of the year when those who read these publications with the greatest interest have not sufficient time at their command to carefully peruse the same. Among the many notices received in commendation of this number the following may be given:

The annual report of the Minnesota State Horticultural Society for the year ending March 31, has been issued by the Secretary, S. D. Hillman. It is the most complete report yet issued, and contains in addition to the State Society's proceedings, the doings of the Minnesota Amber Cane Association at their annual meeting, and the debates of the Hennepin county horticulturists. The book contains much practical information and is a valuable addition to the horticultural literature of the State.—*Minneapolis Tribune*.

The typographical execution is unusually good, while the contents are useful and instructive. It is full of facts worth more to the farmers than any book they would have to pay ten dollars for. It contains all the proceedings of the Amber Cane Association, with a list of their officers for 1885, as well as those of the State Board of Agriculture. There are 465 pages in the combined work. Secretary Hillman deserves great credit for the able and interesting manner in which he has brought the book before the public. It should be in the hands of every farmer in the State.—*Farm, Stock and Home*.

We are indebted to Secretary Hillman of the Minnesota Horticultural Society for a copy of his report for 1885, a neat volume of four hundred and sixty-five pages, filled with the experience of Minnesota's best fruit-growers. As regards apples, the leading tree fruit, the experience is much the same as we get in the cold north-eastern part of Vermont and in the Province of Quebec. Minnesota has sent us the Wealthy, the best iron-clad winter apple, while we have sent her the Scott's Winter, the longest keeper of the same class, and Quebec has furnished the Peach of Montreal, one of the best fall dessert apples in existence. These interchanges, and the general and rapid increase of knowledge in regard to fruit growing are greatly promoted by publications like this report. Many promising seedlings suited to the Minnesota climate are reported as on trial, and the new Russian fruits are having a wide testing, the results of which are full of encouragement, assuring us as they do, of final and entire success in pushing the large fruit culture several

hundred miles farther northward than it has ever gone on this continent heretofore.
—Dr. Hoskins in *Vermont Watchman*.

In the general distribution of reports we have been subject largely to the direction of the Executive Committee. We have endeavored to supply each member of the Society with at least one bound copy of the transactions, and with extra copies in paper covers when requested.

Exchanges have been made with the societies of the following states, to-wit: Wisconsin, Iowa, Nebraska, Colorado, Kansas, Missouri, Indiana, Illinois, Ohio, (Western) New York, Pennsylvania and New Jersey; also with the horticultural societies of Dakota and Montreal, Canada.

In this connection we suggest the propriety of having a larger number of copies of our reports bound in cloth. Five hundred copies are barely sufficient to supply our own members and to make the necessary exchanges. It seems to us we ought to have at least one-half the entire edition bound. The value of the work would then be more fully recognized by those receiving it, and it would find its place upon the library shelf where it would be preserved for years to come, to be referred to conveniently whenever necessary.

The volumes issued by the Society for a number of years past have been creditable productions, and we trust the interest manifested on the part of members in this respect will not flag and that there may be still further improvement made in the character of succeeding numbers.

THE CORRESPONDENCE

which your secretary has conducted during the past year is indicative of an increasing interest which is being taken in horticultural matters generally in this State as well as elsewhere. Extensive correspondence has been had and almost daily letters are received and answered concerning some department of our work. Of course this work requires considerable time to be employed but it is still a pleasing duty to perform. We cannot publish all our lengthy correspondence and yet we ought not to omit what may be deemed of public interest, although our space is somewhat limited. Among the numerous letters which are constantly received are many which should find a place in our transactions. Of these a number will be read or be referred to appropriate committees. One takes peculiar pleasure in perusing letters like the following, received from that eminent and venerable pomologist, the Hon. Marshall P. Wilder, in his own peculiar chirography:

"BOSTON, July 28, 1885.

MY DEAR SIR: Many thanks for the report of the Minnesota Horticultural Society. Like its predecessors it is full of interesting information. Your State has made rapid progress in fruit culture and has become widely renowned for its enterprise and success in this important branch of American Husbandry. It has become an important ally in the labors of the American Pomological Society, and we count largely on its exhibition of fruits at the forth-coming meeting at Grand Rapids, Sept 9th, when the East will come on to shake hands with the Great West. Please send us a full delegation of your noble men.

Yours as ever,

MARSHALL P. WILDER.

S. D. HILLMAN, Secretary etc.

The following sufficiently explains itself:

MINNEAPOLIS, MINN., Sept. 12, 1885.

W. J. Hahn, Esq., Attorney General:

St. Paul, Minn.

Dear Sir:—At a meeting of the Executive Committee of the Minneapolis State Horticultural Society, held on the 10th instant, the undersigned was directed to communicate with you and to ask an opinion in regard to the action of State Auditor Braden in withholding an order upon the State Treasurer for a portion of the annual state appropriation of the Society.

The point upon which the committee desire information is as to whether the Society is entitled to the annual appropriation of one thousand dollars granted to aid the Society, to be expended for such purpose as its Board of Directors may deem necessary and proper?

Section 3 of chapter 72, General Laws of 1881 provides as follows:

SEC. 3. "That the sum of one thousand dollars (\$1,000) be annually appropriated, out of any moneys not otherwise appropriated, to aid the said Horticultural society in the work of distributing their reports, collecting data, specimens pertaining to horticulture, providing a suitable place for its books, specimens and articles of the society, and for payment of salary and expenses of its secretary and committees for labor actually performed by them, and other uses that may, in the opinion of the Board of Directors be deemed necessary and proper. The said sum shall be paid by the State Treasurer on the order of the President of said Horticultural Society."

In order to raise the question fully and to get an authoritative decision upon the same, it may be well to give a statement of the condition of the funds of the Society as shown by the report of the Treasurer as well as the action taken by its Executive Board, since the act referred to has been in force.

At the annual meeting held in January 1882, the President of the Society, in his annual address, called attention to the act of the Legislature and recommended action thereon, as follows:

(See page 43, Report 1882.) "Since the adjournment of our last annual meeting the State Legislature has granted us an annual appropriation of \$1,000. This sum if judiciously used may prove of great benefit to the Society and to the people of the State at large. It remains with you at this meeting to say what disposition shall be made of it. See to it that its disposition shall reflect credit upon us, accomplish the object for which it is designed, and secure for us the confidence of the tax-payers of the State. I am in favor of setting aside a portion of the amount to be used only in the payment of premiums to be offered to encourage the growing of fruits from seeds, the offer to be so guarded as to leave no chance for imposition, and I think that we ought, without delay, to create a committee to perfect a premium list and make rules to govern it. I would say \$500 for the best long keeping variety, as hardy as Duchess or Siberians, of good quality, fine appearance, medium to large in size, to keep until May; \$400 for second best, same rules to govern; \$300 for the third best; \$200 for best winter sweet apples; \$100 for a grape as hardy as the Concord, as good or better in appearance and quality, two weeks earlier and that will keep well into winter. If any or all of these were now originated, it would require five more years to give them the requisite tests and probably \$200 per year would meet the demand."

The Committee on President's address, consisting of Messrs. S. M. Emery, J. H. Stevens and F. C. Gould, subsequently submitted a report which was adopted, in which they recommended action with regard to the creation of a fund for payment of premiums, as follows: (See page 112, Report 1882.)

"Second. That the Executive Committee be instructed to appropriate the sum of (\$200) two hundred dollars, to be set aside annually from the annual appropriation of \$1,000, and invested in interest bearing bonds, interest and principal to be devoted to a premium list, with the object in view of increasing our list of hardy winter varieties of apples, under such restrictions as shall be deemed best by the Society."

The Secretary, in his annual report for that year, remarks:

"With its customary liberality in forwarding projects of public weal, our last regular session of the Legislature granted us an annual appropriation of \$1,000 to aid us in our work, and also increased the number of our reports to be printed by the State and also allowed us an increased number of pages."

Mr. J. T. Grimes, present Treasurer of the Society, at the conclusion of an article on "the cultivation and protection of orchards in Minnesota," says: (See page 121, Report 1882.)

"The State has given us a liberal annual appropriation to aid us in our investigations and experiments and will certainly look to us for its legitimate results."

By reference to the annual report of the Society for 1886, the condition of the reserve fund will be seen at a glance. (See report of Treasurer Grimes, page 219, Report 1885.) It is given as follows :

RESERVE FUND.

Jan. 15, 1884	Accrued Principal.....	\$600 00
Jan. 15,	Accrued Interest.....	43 78
Jan. 20, 1885.	Interest for the Current Year.....	38 62
Jan. 20.	Reserved Principal for 1884	200 00
Reserved Fund Total.....		\$882 40

After giving a statement in detail of receipts and disbursements for the current year the amount of the balance in the treasury is given as the sum of \$257.86. Under the head of remarks the Treasurer says: I would respectfully call your attention to the fact that the finances of the Society are insufficient to meet the expenses and maintain the reserve fund which was placed by order of the Society as a special premium fund to encourage the originating and dissemination of new varieties of apples specially suited to supply the demands and wants of the orchardists of this State."

In the opinion of the Executive Committee the setting aside of a certain amount annually to be used for payment of premiums is in accord with the letter and spirit of the act granting aid to the society as "necessary and proper." The most rigid economy has been observed in order that this fund might be secured for the purpose set apart to be used.

Respectfully,

S. D. HILLMAN, Secretary.

ATTORNEY GENERAL'S OFFICE,

ST. PAUL, NOV. 3, 1885.

S. D. Hillman Esq., Secy. State Horticultural Society.

Dear Sir:—Your communication has been duly considered. It appears that the legislature in 1881 made an annual appropriation to your Society in the words following :

SEC. 3. "That the sum of one thousand dollars (1,000) be annually appropriated, out of any moneys not otherwise appropriated to aid the said Horticultural Society in the work of distributing their reports, collecting data, specimens pertaining to horticulture, providing a suitable place for its books, specimens and articles of the Society, for payment of salary and expenses of its secretary and committees for labor actually performed by them, and other uses that may, in the opinion of the board of directors, be deemed necessary and proper. The said sum shall be paid by the State Treasurer on the order of the President of the said Horticultural Society." (Sec. 3, ch. 72, G. L. 1881.)

That your Society has heretofore annually drawn the entire \$1,000, but has set apart a portion of the money so appropriated to create a "Reserve Fund" which with accrued interest on January 20, 1885, amounted to the total of \$882 40. That this reserve fund was created under a resolution of your society passed at its meeting in January 1882, which is as follows :

Second. "That the executive committee be instructed to appropriate the sum of (\$200) two hundred dollars, to be set aside annually from the annual appropriation of \$1,000 and invested in interest bearing bonds, interest and principal to be devoted to a premium list, with the object in view of increasing our list of hardy winter varieties of apples, under such restrictions as shall be deemed best by the Society.

You say that "In the opinion of the executive committee the setting aside of a certain amount annually to be used for the payment of premiums is in accord with the letter and spirit of the act granting aid to the Society as "necessary and proper." The most rigid economy has been observed in order that this fund might be secured for the purpose set apart to be used."

And my opinion is asked in regard to the action of the State Auditor in withholding orders upon the State Treasurer, for any portion of the annual appropriation while the "reserve fund remains unused, he claiming as I understand it, that the annual appropriation is for current expenses and that the Society has no right to draw and accumulate any portion of this annual appropriation for any purpose.

The State Auditor, in my opinion is right in his holding. Appropriations of public funds must be strictly construed. The constitution declares that "no money shall ever be paid out of the treasury of this State except in pursuance of an appropriation by law." In the case of the People vs. Burns, 27 Barb. 93, the Court in construing a similar provision of the constitution of New York, say, "It is in-

tended as an absolute and compulsory restriction upon every disbursement from the treasury, except under the sanction of a legislative appropriation *specifying distinctly the object to which it is to be applied*, thus imposing a salutary and needed check upon the disbursement of the public funds."

Now the question is, what is the object to which the money appropriated by the law under consideration, was intended, by the legislature, to be applied.

1st. It is an *annual* appropriation and if not all drawn or used during any one year, the balance would not be available in any subsequent year. Opinion of Judge Cornell, p. 260 Opinions Atty's General.

2nd. A number of specific objects are enumerated, all of which are in the nature of current expenses viz.: distribution of annual reports, collecting data, procuring a place for books, &c. (rent) payment of the salary and expenses of secretary and committees, &c. Then follows the provision under which the Society claims the right to set aside a part of the money to create a fund to pay premiums in the future, viz: "*and other uses that may in the opinion of the board of directors be deemed necessary and proper.*" Two familiar rules of construction are that "the expression of one is to the exclusion of all others," and "the enumeration of one class excludes all others not of a similar class." Hence the words "*and other uses*" must be held to mean "*other uses similar to those heretofore enumerated in the law*, that may be in the opinion of the board of directors be deemed necessary and proper."

In other words any other necessary and proper use that will annually, during any one year, "aid the Society in its work" The statute is an appropriation for current aid only and the funds cannot be allowed to accumulate and then be drawn, or be drawn and then accumulated for any purpose or object however praiseworthy.

Yours Truly,

WILLIAM J. HAHN, Attorney General.

The present financial condition of the Society as shown by the treasurer's report, is very satisfactory.

The following is a statement of receipts and disbursements by the Secretary from January 24, 1885, to January 18, 1886, as shown by itemized statement submitted:

Secretary's financial statement.

RECEIPTS.

Membership fees.....	\$51 00
Warrant on Treasurer.....	13 66
Balance due Secretary.....	35 55
Total.....	\$100 21

DISBURSEMENTS.

Stamps, envelopes and postal cards.....	\$46 38
Expressage, freight and drayage.....	25 06
Printing.....	18 75
Delegates at hotel.....	5 00
Stationery.....	3 35
Railroad fare and telegram.....	7 67
Total.....	\$100 21

Respectfully Submitted,

S. D. HILLMAN, Sec'y.

The Annual Report of the Treasurer was then read:

TREASURER'S ANNUAL REPORT.

To the President and Secretary of the Minnesota State Horticultural Society.

Gentlemen:—I have the honor to submit the following report of the receipts and expenditures of the Society for the current year ending Jan. 20th, 1886.

RECEIPTS.

1885.			
Jan.	31.	Balance in treasury.....	\$257 86
	31.	From membership fees.....	63 00
March	7.	M. Cutler, membership fee.....	1 00
June	24.	S. D. Hillman at summer meeting for membership fees.....	29 00
	24.	G. H. Roberts, membership fee.....	1 00
	27.	From State Treasurer of State appropriation....	250 00
	27.	C. A. Smith, membership fee.....	1 00
Sept.	30.	From State Treasurer.....	150 00
Total receipts.....			<hr/> \$752 86

The following disbursements have been made as shown by the vouchers herewith returned.

BILLS AUDITED AND DIRECTED PAID AT THE WINTER MEETING.

1885.			
Jan.	22.	T. M. Smith, incidental and other expenses.....	\$10 00
	22.	J. T. Grimes, for interest on funds advanced and incidentals..	9 02
	22.	J. M. Underwood, railroad fare and expenses attending Executive Committee meeting.....	5 00
	22.	A. W. Sias, expenses on Seedling Committee for 1884.....	10 00
	22.	J. S. Harris, for like expenses for 1884.....	9 50
	22.	J. S. Harris, expenses in attending the meeting of Executive Committee Jan. 15, 1885.....	10 80
	22.	Mrs. Ida E. Tilson, expenses to State meeting on invitation of the Society, Jan. 1884.....	7 70
	22.	Mrs. Ida E. Tilson, expenses on same account Jan. 1885.....	7 50
	22.	The Daily Globe, printing.....	1 50
	22.	Pollock & Co. for use of plates.....	2 00
	22.	C. L. Smith, services as assistant secretary, etc.....	15 75
	22.	S. D. Hillman, Stenographer.....	20 00
	22.	E. H. Cayner, membership fee returned, (being twice paid)...	1 00

DISBURSEMENTS.

1885.

Jan.	22.	Premiums paid at winter meeting, 1885—	
		On fruits.....	\$48 00
		On vegetables and seeds.....	12 25
Feb.	13.	G. W. Fuller, expenses as delegate to Iowa.....	33 87
May	27.	S. D. Hillman, salary first quarter.....	100 00
June	24.	Oliver Gibbs, Jr., balance due on settlement.....	43 33
	24.	Wyman Elliot, express charges	1 55
	24.	J. S. Harris, expenses as delegate to Wisconsin.....	8 85
	25.	Premiums paid at the summer meeting—	
		On fruits.....	56 00
		On flowers.....	17 00
		On vegetables.....	21 00
	25.	S. D. Hillman, as per account rendered.....	42 66
July	17.	H. L. Smith, printing	16 00
	17.	Pioneer Press Co., printing	15 00
	17.	S. D. Hillman, salary second quarter.....	100 00
Oct.	1.	S. D. Hillman, salary third quarter.....	100 00

1886.

Jan.	20.	T. M. Smith, balance on account.....	\$3 50
	20.	S. D. Hillman, freight on books.....	2 23
	20.	Pioneer Press Co., printing circulars summer meeting.....	15 00
	20.	C. A. Merrill, on account of summer meeting.....	5 00
	20.	J. T. Grimes, incidentals for 1884.....	4 76
	20.	J. S. Harris, services on executive committee and expenses.....	10 00
	20.	C. L. Smith, assistant secretary at the winter meeting 1886.....	15 00
	20.	Rent of hall for winter meeting and janitor's services.....	23 00
	20.	T. M. Smith, salary as President 1885.....	25 00
	20.	S. D. Hillman, salary fourth quarter.....	100 00
	20.	Treasurer's salary 1885.....	25 00
	20.	E. H. Cuzner salary as librarian 1885.....	10 00

Total expenditures.....	\$943 85
Receipts for the current year.....	\$752 86
Overdrawn.....	190 99
	<hr/>
	\$943 85

The report of the Treasurer was on motion accepted, and with the financial report of the Secretary referred to the Executive Committee.

FINANCE COMMITTEE'S REPORT.

To the President and Members of the State Horticultural Society:

We, the members of the Finance Committee beg leave to report that we have examined and audited all bills as presented, and have

examined the books, vouchers, and annual report of the Treasurer and find them all correct.

J. S. HARRIS, Chairman.

WYMAN ELLIOT,

M. PEARCE.

Following is the report of the Librarian :

LIBRARIAN'S REPORT.

Total number of reports of Transactions of the Minnesota State Horticultural Society now on hand: 1866-73, (combined) cloth, 210; 1874, paper, 375; 1875, paper, 220; 1876, paper, 1,020; 1877, paper, 340, cloth, 10; 1878, paper, 140, cloth, 30; 1879, paper, 9, cloth, 10; 1880, cloth, 102; 1881, paper, 1,210, cloth, 250; 1882, paper, 1,680, cloth, 600; 1883, paper, 143, cloth, 1,005; 1884, cloth, (about) 300; 1885, paper..., cloth 75.

BOOKS RECEIVED.

Among the volumes received during the past year are the following :

5	Copies	Wisconsin	Horticultural	Reports,	-	-	-	1883
6	"	"	"	"	-	-	-	1884
50	"	"	"	"	-	-	-	1885
25	"	Dakota,	"	"	-	-	-	1885
6	"	Illinois,	"	"	-	-	-	1884
6	"	Michigan,	"	"	-	-	-	1882-4
6	"	Kansas,	"	"	-	-	-	1884
50	"	Montreal,	"	"	-	-	-	1884
10	"	Missouri,	"	"	-	-	-	1884
25	"	Iowa,	"	"	-	-	-	1884
6	"	Indiana,	"	"	-	-	-	1884
5	"	Colorado,	"	"	-	-	-	1885
5	"	Nebraska,	"	"	-	-	-	1884

About five hundred copies of our reports have been sent out during the year by the librarian.

E. A. CUZNER,
Librarian.

REPORT OF COMMITTEE ON NOMENCLATURE.

Your committee heartily approve the efforts being made by the American Pomological Society, and other societies looking to the

shortening of the names of fruits. This is a matter of national importance—a scheme in fact in which all nations are interested; and were it possible for a committee from all nations to meet at Boston during the next session of the American Pomological Society at that place and bring about this much needed reform—it would, as P. Barry remarked “be the crowning work of the American Pomological Society.

A. W. SIAS.

WYMAN ELLIOT.

DISCUSSION.

Mr. Grimes. Under the ruling of the Attorney General, as I understand it, we cannot draw any money from the State Treasury until after we have expended it. You will notice, gentlemen, in my report that I have not included the funds we had on hand for paying premiums, which is \$842. 68. We cannot hold that for any purpose as a permanent fund, and I would recommend to this Society that we change that fund and make it a contingent fund. If we cannot draw anything ahead, when your bills are all in, you will have nothing with which to pay them. Disbursements are made the first day of February and the first day of August in each year. We can draw the funds to which we are entitled to close up all outstanding bills. But your summer meeting is coming on; your Secretary, in the mean time, will be entitled to \$200, and you will need funds on hand to meet expenses. I don't think we ought to allow our Society to run into debt and be borrowers upon some one's generosity. Now, we can hold that fund, I think, under the law, but we will have to hold it as a contingent fund; we can borrow from it from time to time, always replacing it when we receive our appropriation. As a contingent fund there will be no question as to our right to hold it.

Mr. Smith. In regard to experiment stations referred to in the report of the Secretary, I think that is one thing that should be discussed, when the time arrives.

Mr. Harris. I think the Secretary has discussed that pretty well; I regard it as the best Secretary's report I ever heard.

Mr. Smith. There are some things that I think call for a little discussion on some of the matters suggested in this report. Reference is made to the experiments going on. I think this Society ought to take some action by which the information brought out in these experiments can be obtained by the people of the State. Our active membership is

only about 200; our reports are limited in their circulation and we ought to manage in some way to place the information brought out in these meetings and these experiments into the hands of more of the people of the State. The organization of local societies is a work that has been materially neglected, and I think we ought, as a Society, and that our Executive Committee ought to do more in regard to the organization of these local societies and getting reports from them; and when a society is organized we ought to assist in keeping up that organization. We have heretofore set aside \$200 a year as a reserve fund; we find that under the law we can not do that. I suggest that we do as the Michigan society did; they issued a fifty-page "Primer of Horticulture"; they had ten thousand copies struck off, and put into general circulation throughout the State. That "Primer of Horticulture" was made up of articles on the subject of fruit from some of the most practical men that could be found, by some of the best men of that society, and it has done a grand work in that state. I will offer the following resolution: That it is the sense of this Society that any balance of funds over and above current expenses be expended in the work of organizing local societies and the distribution of horticultural literature, under the direction of the Executive Committee.

President Smith. That would provide for spending all the money.

Mr. Smith. I only wish to include what we have held as a reserve fund. I would sooner take the chances of using that \$200 in the way I have suggested, than any other, and then if necessary, go to the legislature and ask them to pay it. I think that \$200 expended in work of that kind throughout the State would increase the interest in horticulture generally and greatly increase our influence, as a Society.

Mr. Grimes. I am afraid your opinion would be very liable to mistake.

Mr. Smith. Our appropriation is small. We want a membership outside the ranks of our two hundred members; we want to get two thousand or ten thousand men, if possible, in the State interested in horticulture, and to do that we must place horticultural literature in the hands of more people.

Mr. Harris. I don't see any necessity whatever for the project proposed. I think we are expending our funds where they will tell to the best advantage of the Society. I do not see the necessity of making it compulsory with our Executive Committee to publish a Primer of

Horticulture. Our proceedings go out in the newspapers; they will publish them every year, and won't charge one cent for doing it. There are perhaps twenty-five thousand families that our proceedings will reach by this means, and by subscriptions the number may be largely increased.

Mr. Pearce. I think there is more general information gathered from the press than from any other source. Local societies should be established over the State, with good live members, their transactions and proceedings published in the local papers would attract public attention and interest; and in connection with that, a few good lecturers, posted on the subjects on which they speak, would do more to disseminate a knowledge of horticulture and educate the people in the growing of the various fruits than all the books that are published. Books might be piled up here to be sent free on application, and there wouldn't one man out of a hundred ever call for them. It is only those specially interested that would call for these publications. But if a public lecture is given in a town, with proper billed notice given, and a hall procured, the house would be filled and in all probability right there a local society would be established. We want to spend a little money in the way of lecturing; I don't believe it could be spent in any better way.

President Smith. I would call the Society to order. Mr. Smith's resolution has not met with a second; it is not properly before the Society.

Mr. Pearce. I will second the motion merely to get it before the house.

Mr. Cutler took the chair, and President Smith moved as an amendment to the motion that the unexpended balance now in the treasury be placed as a contingent fund in the hands of the Treasurer.

The motion was seconded.

Mr. Underwood. It seems to me that the latter motion utterly destroys the former. I don't think it would be proper to pass upon a resolution that completely wipes out the resolution under consideration.

Col. Stevens. Do I understand the original mover accepts the amendment to the resolution?

Mr. Smith. No, I don't see any relevancy.

President Smith. From the reading of the resolution, as it was originally put, it would leave our treasury destitute. It is bad policy to get in debt. And we cannot possibly foretell what expenses six

months ahead are going to be incurred. I have been a member of this Society for a good many years, and a good many others here will join me in the assertion that we many times have had to "put our hands in our pockets" to accomplish anything; our funds were not sufficient. It has been one constant effort of the Society to get out of debt. If we have any unexpended balance, as I understand, in the treasury, they are willing under the rulings of the Attorney General, to pass it to our credit, and we can keep it until we can see intelligently what use we may desire to make of it for the best advantage of the Society, and that will redound to the best good of the people of Minnesota.

Mr. Harris. I don't see any necessity for it, and I am opposed to binding the Executive Committee as Mr. Smith's resolution would bind them. I don't want it to be hampered by any such resolution, and it is unnecessary.

Col. Stevens. If I understand it the original resolution is not before the house at all.

The Chairman. I think it is.

President Smith. I will withdraw my motion for the sake of letting the original motion come before the Society.

Col. Stevens. Vote on the amendment, and then if the amendment is carried, vote on the resolution as amended; that is the parliamentary rule. All this discussion is out of order.

The Chairman. I shall have to decide that the original motion is before the house, as the amendment offered was entirely distinct from the resolution.

Col. Stevens. That don't make a bit of difference; the resolution and the amendment may be as far apart as the heavens and the earth.

Mr. Underwood. I can't agree with Col. Stevens; you might make a motion to build a flour mill; it wouldn't have anything to do with this motion at all. I am certain that the chairman should rule the amendment out of order.

Col. Stevens. I have been a member of both houses of the legislature, and I have seen a member bring in a resolution and an amendment would be offered to it which was entirely foreign to the subject of that resolution, and I have seen it passed.

The Chairman. I will call for the reading of the resolution, and if there are no further remarks I will put the motion.

The resolution was again read.

President Smith. I think under the law that would be out of order;

if you read the law, you will see that it leaves it with the board of directors to spend the funds of the Society for certain purposes, and I don't think we have a right to spend it for this purpose.

Mr. Smith. The resolution does not make it absolutely binding upon the Executive Committee; but it recommends that such unexpended balance as there may be over and above current expenses should be used in the manner indicated.

Mr. Grimes. I should regret exceedingly to have this pass. You have a capable Executive Committee, why not leave it discretionary with them, and not make it binding upon them to spend every dollar of the appropriation on hand in a certain way. I think it would look a little bad on the face of it.

Mr. Sias. I take the same ground as Mr. Grimes. It would look as if we were trying to spend our funds in order that we might immediately draw the balance from the treasury. I don't think it would look exactly right.

The motion was then put, and was lost.

President Smith. I now offer the resolution that the unexpended balance in the treasury be placed in the hands of the treasurer as a contingent fund, to be drawn upon as needed.

The motion was adopted.

The following paper was then read:

GRAPE GROWING IN MINNESOTA.

By SAMUEL T. DOUGHTY, Lake City.

At the request of your Secretary I will endeavor to state the method I pursue in growing grapes in Minnesota.

Born and raised on Long Island I was accustomed to seeing fruit, and it was to be had without the trouble of my growing it.

I came to the Lake Pepin Valley in 1855, when white men were scarcer in that locality than now. My life was that of a frontiersman and I had little time or opportunity to do else than to provide the necessaries of life.

In 1865 I began to investigate the subject of grape culture, depending on books for my information. It all seemed very easy and plausible as there shown with nice cuts. But some way or other I did not get the fruit in quantities to suit me, so I began to investigate for myself the habits of the vine and its fruiting.

The books told me to cut to the third joint, or the system known as

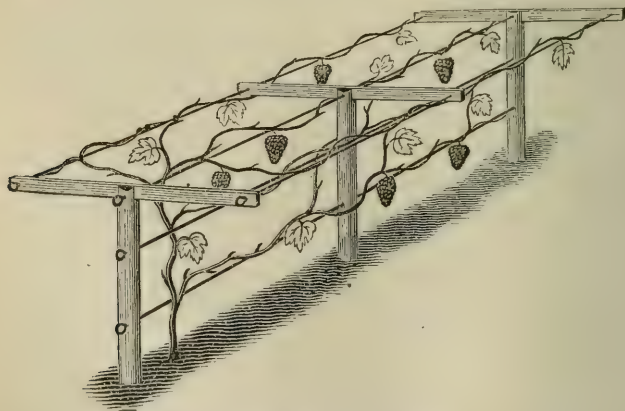
close pruning; which does well enough for the nurseryman who wants grape wood to set; but I soon satisfied myself that success in the object I sought demanded and depended upon an abundance of fruit-bearing wood.

As a boy, at the risk of my life oftentimes, I had ventured out on the limbs of trees to reach the best clusters which I invariably found at the ends of the vines.

Dame Nature usually knows her business and here was a suggestion that I commenced to act upon and, instead of cutting to the third joint, I from year to year increased the length of my bearing canes until they were from six to ten feet long, depending on the vigor of the root and the ripeness, or mature condition of the wood.

I will briefly narrate the manner of operation commencing from the ground.

Two-year old vines are the most desirable. The ground should be in good condition and I would plant in rows running north and south twelve feet apart; the vines should be set on ridges eighteen inches to two feet high and ten feet apart on the ridges. For a trellis I use posts out of the ground five feet with a two by four scantling at right angles with the row, four feet long. I string two wires on the upright posts and on the cross scantling three wires, one in the center and one at each end.



Grape Trellis, with wire attached.

I grow mainly Concords and am not troubled with mildew or any disease. I manure the ground liberally by mulching with well rotted manure, drawing the fibrous roots to the surface where they get abundance of moisture. As rapidly as possible I draw the bearing canes onto the top cross-piece, pruning the leaves off partly below

the cross-trellis and allowing a free circulation on the upright posts so that the fruit as it comes to maturity will have ample access to all the air and sunlight that can be had.

The wires are so arranged that they can be drawn off the trellis in the following manner: The wires run the full length through augur holes in the tops of the posts. They are coupled in lengths of one rod each; by unhooking the coupling they can easily be drawn out, allowing the vines to drop to the ground where they are then covered with straw and earth as they lie on the ground between the rows; the snow collects on the straw and they winter perfectly.

When the vines get too large to handle easily I lay them on the ground and cover them for a new root; thus layering them, the result is a strong rapid growth of new wood. In trimming I never allow any old or stubborn wood to remain; but manage to have young sprouts coming on all the time, and when the old vines are not needed for layering I cut them off in the fall, always retaining enough wood to fully cover the trellis; in fact I make the root carry about all the wood I can get that is young, sound and thrifty, merely cutting back the terminal limbs and thinning them out.

I have this year on a single hill grown 216 pounds of grapes by actual weight. And I am confident that this vine will in the coming season produce 500 pounds of grapes.

I am also growing two varieties of California grapes, also the Janesville, the Prentiss and the Brighton, and all are doing well under the method above described.

Early frosts last spring caught fully one-third of the crop after the grapes had set, but with my plan as above explained the vines were up to the sun and moisture and the direct result was a second crop of bloom in ample time to ripen; all of which I attribute to the high, shallow, surface culture.

The following paper was then read by Mr. Latham:

GRAPE GROWING AT MINNETONKA.

By A. W. LATHAM, Excelsior.

To the fruit grower who has interested himself in this direction, the culture of the vine in this vigorous climate has been for many years an assured and certain success. But it is only of late that this is becoming generally known, and an interest awakened in this direction.

The recent devastation of our orchards of hardy trees, from which so much was hoped, is a prominent cause of the present general interest developing on this subject. While the Wealthy and Duchess and other iron-clad trees and plants have succumbed to the fierce, cold winds of January, the vine, snugly tucked away in its winter bed, has come forth year after year, bearing its annual and certain crop of most luscious and wholesome fruit. And while the severity of our winters have forced us to lay them under half a foot of earth and a coverlid of mulch, this extra care required has in itself been the means of our producing the largest berries and the handsomest and most perfect bunches known in the culture of American vines.

The vine grower in this climate has a large list to draw from, limited almost solely by the time of the first severe frost in the locality where he intends to plant.

The very earliest ripening grapes, like Moore's Early, Lady, and Early Victor, can be grown with a reasonable assurance of success in nearly every garden in the State, while the varieties of equal or greater value can be planted in more favorable localities; and in very favorable locations, where the soil is a clay loam with much fine limestone, elevations high and sheltered, well protected on the north and west by large bodies of water, varieties ripening as late as the 1st of October can be grown year after year with success. Even the late ripening Catawba can be perfected to such a degree as to snatch the laurels in competition with that variety grown in its native home.

In many localities in our State the vine is being cultivated successfully, and the planter may confidently expect to harvest year after year fine crops of fruit.

Of the locations especially favorable which I have visited, or with which I am well acquainted by report, there is none that surpasses the high, rolling and well timbered land on the south and east shores of our beautiful Lake Minnetonka. The culture of the vine here is rapidly becoming an industry, and it will soon be difficult to get out of sight of a vineyard along six or eight miles of this shore. The north and west shores and the islands and point of this lake also have vineyards which are doing well.

The number of bearing vines about Lake Minnetonka has been largely over-estimated, and I do not believe the number of full bearing vines to exceed 10,000, while, including the unusually large plantings of last spring, the whole number of vines now planted may be in the neighborhood of 30,000. The crop the past year from these vines was, doubtless, not to exceed 50,000 pounds.

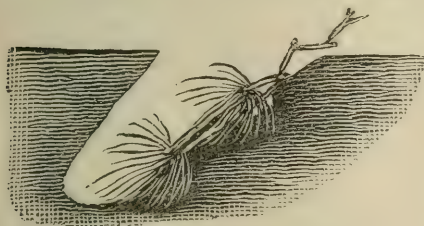
It is not my intention in this article to give full directions for planting and caring for the vine, for the benefit of the planter who is going into it as a business, as he will of course provide himself with some of the many good works on the subject, and become thoroughly posted; but if by a few plain directions I could induce every householder in the State to plant a dozen vines, and, with the little care necessary raise what grapes his family would use, instead of wasting his money on pear trees from Alaska and cherries from Lapland, at \$2.50 apiece, my trouble would be well repaid.

And now, first, before planting the vines he must get them. In locations liable to early frost, the planting must be limited to two or three very early ripening sorts, as Moore's Early, a hardy black grape of excellent quality, and the Lady, a greenish white grape, very rich and sweet; or, if not so particular about quality, the Janesville, a very hardy black variety, sure to bear a good crop of rather poor quality of fruit. If the location is reasonably exempt from early frosts, the list may be extended by the addition of the Worden, Cottage, Delaware, Brighton, and some of the Rogers. These are all excellent varieties, with which the public are generally familiar.

The standard variety of the country, the Concord is somewhat later in ripening than those named, and should not be planted largely, except in places so well protected from frost as to be safely adapted to the culture of the grape on a large scale for market.

In my different vineyards I have tried setting vines at distances apart varying from six to ten feet. My conclusion is that the rows at eight feet apart afford sufficient room for sunlight and air, and for winter covering the vines. In the row, seven or eight feet is sufficient.

Before planting, if the vines come to you with roots two or three feet long as is often the case from Eastern nurseries, they can as well, be cut off to a length of three or four inches, with equally good results and much labor saved in planting. Also trim the top of the vine to one straight cane, cutting away all the branches



save them from winter-killing.

Dig a slanting hole wide enough to take in these shortened roots without bending. In planting place the vine deep enough to bring the crown five or six inches below the surface, which will get the main roots under ground, and

The vine as planted should slant in the direction in which it is intended to be trained upon the trellis. This direction will depend upon the prevailing winds. For instance, if the trellis is built running east and west, and the prevailing winds in summer are from the west the vine should slant towards the east and be trained in that direction on the trellis. This is an important point in keeping the vine well spread upon the trellis.



I am unable to see a difference in the success of my vines depending upon the direction of the rows. The rows may run toward any point of the compass convenient, only be careful to lay them out horizontally around the hillside to prevent the ground from washing. Some south slope for a location is undoubtedly better, as hastening a little the time of ripening, but the grape will do well on any slope, even a north slope, and the matter of protecting the growing vine is of far greater importance generally than the question of slope.

The newly planted vine should be well cultivated, and permitted to grow the first season without restraint, and in the fall pruned by cutting off all branches and side shoots, and cutting the cane back to within a foot of the ground.



The vine should be buried for winter by pressing the cane to the ground and covering it with four or five inches of soil, and later on, before cold weather

sets in, applying for protection, a mulch of two or three inches depth of straw or other suitable material. This winter mulch is absolutely necessary to insure the safe keeping of newly planted vines, and should be repeated for several winters at least. The following spring a stake six feet long should be set close to each vine. Permit only one bud to grow, and that the strongest which starts, getting rid of the other shoots by rubbing them off while small. Tie this growing cane to the stake as it grows, and if it is making a very vigorous growth it will be well to pinch off the end when it reaches the top of the stake. The laterals, which are the little branches that start out along the sides of the growing cane, should also be pinched at their ends when they have pushed out the second leaf.

Thus, the second fall's pruning will consist in cutting off all the laterals up to the cane, and in pruning this cane leave about two-thirds of the growth it has made this year, not to exceed four feet.

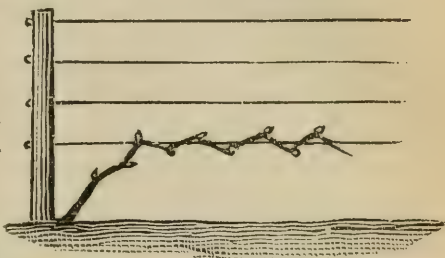


The vine may now be buried as directed for the previous year, and it will be found convenient to take out a little earth close to

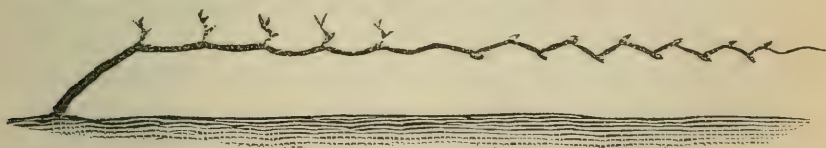
the vine on the side where it is to be bent.

As the vine gets older and stiffer, in laying it down for winter it will be found to bend easier and more safely below the ground, which the removal of this earth will permit.

The following, or third spring the trellis should be built on which the vine is to be trained. In my experience I have found posts set twelve feet apart, sufficiently near to sustain the weight of the mature vine. If the rows



do not exceed 125 feet the posts will need no bracing. Use four wires, No. 12 galvanized iron, the lowest one about 10 inches from the ground, and those above about 10 inches apart. They should be fastened with staples driven in so as to allow the wires free play. The wire should be fastened securely about one of the end posts, passing through the other end post, and drawn snug every spring by the use of small rollers and pins. Along the lower wire of this trellis the vine is to be tied.



If the vine has wintered well, two shoots will grow from nearly every bud. These should be thinned out when they have made a growth of two or three inches, leaving the strongest shoots at a distance of about ten inches apart. These shoots must be tied to the wires as they grow, and pinched off at the end when they have reached the top wire. This pinching will check the growth a little, and should be repeated when they commence to grow again, and so on, leaving one new leaf to grow at each pinching. The laterals, heretofore described, should be pinched off just beyond the first leaf, and when they start to grow again pinch a second time leaving another leaf, and so on during the growing season. If the vine is thrifty it will bear this year several pounds of fruit. As soon as convenient after gather-

ing the fruit the vine may be pruned and prepared for burial, not necessarily waiting for a frost to kill the leaves as it will do no harm to bury even with some of the leaves on the vine. In pruning, this, the third fall, first select a cane near the extremity of the vine which was tied last spring to the lower wire, and cut it off at a length sufficient to reach the next vine on the trellis. This cane must be tied to the lower wire next spring, and will complete the permanent vine. The laterals should be cut off from this cane; the remaining canes must be cut back, leaving only the two lower buds, and any laterals on these spurs must be removed. In pruning do not cut within an inch of the bud, to avoid its winter killing. Bury as directed.

The next spring, the fourth, tie to the lower wire as directed, and permit one or two canes—and no more—to grow from each of these spurs, saving always one cane from as near the base of the spur as possible.—In pruning hereafter you must leave the cane last described, cutting it off at two buds, and then cutting off the old spur just above where the new spur starts. The new cane laid down to extend the vine this year should be treated the same as directed for the vine last year. When pruned in this, the fourth fall, the vine will consist of a main arm extending along the lower wire of the trellis to the next vine, with spurs of two buds each standing some ten inches apart.

The subsequent summer's treatment will be a repetition of the treatment suggested for the spurs last summer, and each fall's pruning will leave the vine about as described. If the summer pinching is followed up persistently as directed, the two buds at the base of the canes which are to be left, in this system of pruning, will generally be well developed fruit buds, and will bear a good crop, but carelessness in permitting a long, unchecked growth of the canes or laterals will result in locating the fruit buds higher up, and fall pruning will leave little or nothing that will bear fruit another year.

If it were convenient to leave long canes for next year's fruiting, as is often done in localities where it is not necessary to bury, a more slipshod treatment would answer; but to keep the vine in good shape to bury, it must be pruned to short spurs, and to perfect these spur buds for fruit requires persistent checking of the growth during the growing season.

It is a good plan before burying the vine to remove the earth to a depth of three or four inches close to the vine and cut away any roots which have started that near the surface of the ground. It would be well to repeat this every other fall.

Do not be afraid of giving these vines good care. They will amply repay you for your extra trouble. Use a one-horse plow spring and fall, and cultivate and hoe repeatedly during the summer.

There is only one way of raising good crops of fine grapes, and when you have learned to practice that, you have the key of success to any branch of business or avocation in life. Do it most thoroughly. Plant only as many vines as you can look after aright. A dozen vines properly treated, will bring you more profit than a hundred neglected ones, and perfection in this little matter may show you the road to success in greater things.

DISCUSSION.

A Member. Do you plow early in the spring?

Mr. Latham. I do plow early in the spring, and I plow late in the fall. The first thing I do in the vineyard in the spring is to plow, and the first thing I do after getting the vines up is to plow—not deep enough to break the roots. I suppose the plow does cut some roots, but no harm is done plowing twice a year, if I don't plow deeper than three or four inches. I do not think the vines are injured by taking off a few roots. By taking off a large number it might injure them. I pinch off the end of the vines; I do not remove the leaves. You will have to pinch off a foot of the vine some times; I just pinch off the ends for the purpose of checking the growth.

Mr. Pearce. Last fall, during our State fair, Mr. J. B. Rogers, of New Jersey, was here, and I took a great deal of interest in what he said in regard to trimming, and in regard to fruit growing generally. First he condemned late cultivation and deep plowing. He would let the work in the spring be thorough but in the latter part of the season he condemned deep plowing and cultivation. He favored very shallow plowing, just surface work, before the grapes ripened. After the season of ripening commenced, he said we ought to stop cultivation entirely. I was with him probably ten or twelve days altogether. Again, he was very particular about the trimming, that is by pinching back. He did not allow the vines to run over a certain length; I think about four feet was the height preferred; anything over that was equivalent to a certain amount of weeds. In speaking of pinching back he said the laterals were the parts on which the finest fruit could be grown; those must be watched very carefully. By pinching you check the forward growth, throw the sap down into the fruit-buds and develop those. He said the whole process was in the hands of the

trainer, and the proper thing to do was to seek to throw the strength of the vines in the fruit buds and develop the fruit.

Mr. Pearce here exhibited some vines to illustrate what he had said, to show the different kinds of buds, etc. Buds are divided into four classes: fruit buds, wood buds, forcing and foliage buds. A fruit-bud is a perfect bud; it is perfectly round at the base, and a little above it bulges out in the shape of a hay-stack. The forcing bud is inclined to be flat, but little inclined to be peaked. The wood bud is a long, peaked, sharp bud; there is the distinction. Now, in pinching your vines back, let the laterals remain, don't destroy them, if you do, you destroy the fruit buds. You want to develop the fruit buds. That is what you need for the next year.

Mr. Kellogg. Does he claim there are no fruit buds on the main cane?

Mr. Pearce. Oh, no; but we pinch the laterals you know to establish fruit buds on the cane, although we often see them on the laterals. In trimming our vineyard this season the laterals were entirely destroyed.

Mr. Harris. Mr. President, I think there should be no cultivation in the vineyard after about the 10th of August. All pinching should be suspended as early in the season as that. Any pinching later than that I find is injurious. Any great amount of foliage that you remove after the growth has commenced is damaging, because it weakens the vitality of the vines, and therefore all pruning should be done in the pinching back of the vines, and that too as soon as the bunch is well formed. When the ends of the vine are pinched back, the sap immediately goes to forming the buds below, and developing the fruit buds that are necessary. Unless the laterals and sprouts from the bottom are allowed to grow too much, the vine will produce just about so many fruit buds. One of the greatest objects of pinching back is to have those fruit buds down at the base of the vine where you can control them, instead of out in the trellis. Any man will notice, that has had experience, that the finest bunches are on the lowest bar of the trellis.

Mr. Sias. I don't wish to discuss this matter. I have thought there might be some new beginners that might possibly be discouraged, or confused by hearing so much about different buds and pinching, and all that sort of thing. It seems there is a wide range between these two papers. I would say, in the first place, these two parties that wrote these papers are among the most successful grape growers in

the State. One of them, it appears, constantly pinches back his vines, while the other trains them very high. By the latter system it seems he has had wonderful success, but he does not tell us anything about pinching, and the idea occurred to me right here (and it may be an encouragement to new beginners) that after all that has been said there is possibly more in the style of the man than there is in the style of the pruning.

Mr. Tuttle. I think the vine requires different treatment on different soils. Different varieties of grapes require different treatment. Now, this first paper advanced the idea that we must have a considerable amount of canes. That depends upon the variety of grape. I have never been able to raise grapes on rich soil without long canes. With the Concord on rich soil it requires a good deal of vine. You can pinch back and cut back closely while the vine is young, but the Concord needs more vine in a rich soil than others. There is a gentleman in my neighborhood who has two Concord vines that have been growing for a number of years. He has grown from six to nine hundred pounds of fruit on those two vines. He gives them abundance of cane, and the crop is as regular as the year comes around. If you put the Concord on heavy clay, which is the best soil you can put it in, it don't need so much top cane as it does on the rich prairie soil. We practice pinching off before blossoming; I find it increases the weight of the cluster to nearly double. Since we have practiced that we have had no trouble in getting very large clusters of grapes, and an abundance of them.

A man in our place had a Rogers vine, and a cow bit off the end of it. That vine produced wonderful clusters; he went on and treated his vineyard in that way, and I never saw such clusters for fruit. I can go in there and get a bushel of grapes of the heaviest clusters as large as we ever exhibited at our State fair. I commenced the same practice (but I don't use a Jersey cow) and I have had a very good proportion of large clusters ever since. I pinch off the ends of the vine just before blossoming. I am very confident that practice will increase the quantity of fruit, and it will certainly add to the size of the bunches.

Mr. Kellogg. I have listened with interest to these two admirable papers that are more particularly designed for professional growers, noted the different modes of treatment of the soil, and the different methods of cultivation; one mulches and the other plows deep. One of them, perhaps both, practices summer pinching and summer prun-

ing. Now, to a new beginner in planting, with the discussion we have here, it seems to me it will tend to a confusion that will discourage almost anyone. The papers are admirable, but there is a marked difference in the treatment by the two men who have both been so successful.

Mr. Smith. Mr. Doughty has a sandy soil, and Mr. Latham's is a clay soil.

Mr. Kellogg. That will explain the different modes of soil treatment. One of the most successful orchardists in my county has a good many vines. He said he had more consolation and more pride in the fact that he had never pruned than anything else he did. The Janesville was recommended in one of the papers, but to my thinking the Janesville is good for everything but to eat. It is certainly a poor quality of grape, but productive enough. It will bear good and bad treatment. Now, I would say to those farmers that want to raise a few grapes for their own use, not to be scared to death by these professionals that pinch and prune all summer. Set out your vines, put them down in the fall, and take them up in the spring, gather in their season, and get your fruit.

Mr. Latham. I want to say a few more words before this discussion is closed. Of course, I did not undertake to cover the whole ground. I think the cultivation of the vine is pretty generally understood by the practical members of this Horticultural Society. Mr. Doughty mulched his soil instead of cultivating. That is a very good idea; there can be no objection to mulching for a dozen or two vines, but if you commence to mulch, you will have to keep it up; you can't leave it off. You can make up your mind to that, because it brings the roots to the surface, and if you leave off mulching and there is no snow on the ground, the roots will winter-kill. My object in plowing in the fall, was not to cultivate at all, to get layers with three or four inches of soil over these.

There are two ways to train the vine. If you choose to let your vine grow in a loose manner it will grow along the fence, but in order to get fruit you have got to leave the wood; that is all there is about it. You have got to have a long vine with a great many branches, and save the wood; if you don't, you won't have any fruit. If you want to raise a few vines and get them in a neat, compact shape, then summer pinching is necessary. When the growth gets to be what you want it, one, two, or three feet, stop it right there. I very nearly killed my stock of Delawares once, by following Fuller's directions.

I thought Fuller knew everything in those days and I didn't; I waited before pruning till the berry was the size of a currant; I was anxious to get the best results. I took off half the foliage; it made the vines look sick, some of them, and made me sick. I then began pinching, and discovered that I raised some pretty good fruit.

Mr. Underwood. Just a word in explanation of Mr. Doughty's plan of grape culture. He does not recommend anything; he simply tells what he has, and what he is working with; and he doesn't offer it as a professional plan for raising grapes or anything of the kind. He has simply told how he raises his grapes, at the solicitation of the Secretary of this association and myself. I know Mr. Doughty very well, and I know he will get more vines and more grapes from about forty vines than anybody else gets from—I was going to say a hundred vines. I know a man on the next block that makes grape growing a speciality, and I think Mr. Doughty had more grapes from a single vine than he had on his whole lot. I think a plan that brings forth such excellent results, whether it is a professional's plan or an amateur's, or whatever it is, ought to be known and brought out. I would like to see Mr. Doughty's plan illustrated with cuts. I have set out some vines and I am going to try it on his plan. He has mainly, as you see, the Concord variety.

Mr. Harris, on behalf of the committee on grapes, then read the report of the committee:

GRAPES RECOMMENDED.

Your committee appointed to present a list of grapes for general cultivation in Minnesota to be adopted by this Society do respectfully submit the following:

1st, Concord; 2nd, Worden; 3d, Moore's Early; 4th, Delaware; 5th, Lady; and for general trial Early Victor, Brighton, Oporto.

J. S. HARRIS,
W. E. BRIMHALL,
J. T. GRIMES,
TRUMAN M. SMITH,
O. E. SAUNDERS.

On motion of Mr. Pearce, the list as presented was adopted by a vote of thirty in favor, and none against.

The following paper was then read :

HUMBUGS IN HORTICULTURE.

By M. CUTLER, Sumter.

Our constitution says the object of this Society shall be to improve the condition of pomology, horticulture and arboriculture, by collecting and disseminating correct information concerning the culture of such fruits, flowers, trees, and other horticultural productions as are adapted to the soil and climate of Minnesota. Now, if this is the object of the Society it is its duty not only to recommend the best methods of accomplishing that object, but to oppose and denounce everything that is calculated to prevent it. I see before me the tree planter, the nurseryman, and the farmer, all members of one body, working together harmoniously. The natural inference is that their interests are identical, and the inference might be correct if it were not for another element that comes between the two. This element is notoriously scarce at horticultural meetings. I refer to the tree agent, not to the honorable, upright one, but to the sharp, tricky fellow who has no regard for the gray hairs of the aged, or the poor crippled defender of our country, if by fraud, trickery and lying he can sell inferior nursery stock at enormous prices. Two of these leeches can do more injury to horticulture in a county in one month than twelve honorable men can overcome in five years. They deserve the fate of the serpent that caused the expulsion of Adam, the first horticulturist, from the Garden of Eden. Surely of all humbugs the professional tree agent is the greatest. He is to an honorable man as a green persimmon is to the luscious peach. To illustrate their wily ways I will give some of my own experience and that of others in our county. Some five or six years since an agent from Dayton, Ohio, came into the county and sold stock to the extent of several hundreds of dollars. He was so oily tongued that he made some of the farmers believe that even prunes and pears would grow there. One poor German farmer was induced to buy nearly one hundred dollars worth. The stock delivered was overgrown and worthless, such as nurserymen are glad to sell for a song, and sing half of it themselves. The poor man not only lost his money, but the time spent in setting the stock out.

Last spring, as I was transplanting strawberry plants, there came into my field quite a portly fellow who introduced himself as an agent for a well advertised chain of nurseries, located in Wisconsin, Ohio, Kansas, etc., and stated that he was selling nice crown budded trees grown at Sparta, Wis. He exhibited a large number of specimens of wood cut from black-hearted Wealthy and Duchess root-grafted trees, also a specimen of wood, white and sound, which he said was cut from budded trees he had delivered at Arlington. He next exhibited root-grafts and a seedling root well supplied with small fibrous roots, which he claimed to be of Freuch crab origin, and stated that they took a two-year-old French crab seedling, budded it, then let it stand three years in the nursery, when they sold a three-year-old tree on a five-year-old root. He said that where the union was made in root-grafts; mold formed, which was the cause of black-heart. He would warrant his trees, and if they died he would replace them. He offered to let me have half a dozen for five dollars. I told him I had not heard before that budded trees were hardier than root-grafts, that if such was the case I thought our nurserymen would prac-

tice budding, and that I would investigate the subject before buying. He next tried me on small fruits. I told him I had enough for the present. He said "Come and see what I have got." So I went with him, and I must say that greater devices for taking the eye and tempting the palate of the unsophisticated farmer and lover of fine fruits could hardly be devised. First, a grand display of pictures, showing fruits of enormous size and brilliant colors. Then bottled specimens by the dozen; huge arctic plums that were perfectly hardy as far north as Manitoba, for only one dollar each; Mrs. Garfield, the largest and most productive strawberry grown; Taylor's Prolific blackberry, the hardiest and best grown (mine freeze down most every year); Crimson Beauty raspberry, etc. When he got through with his false statements, I told him I had not patronized tree agents for several years, and did not intend to soon; that I bought direct of nurserymen. And he left to seek for other victims, of which he and his partner found so many that they sold several thousand dollars' worth of stock which has been delivered and is reported by some to be fine looking stock, probably from Ohio. And now, with anxious hearts, they will watch and wait to see whether their Wolf River apple trees produce crabs, or their Russian mulberry trees produce currants, as they did in Illinois. A short time since one of my neighbors called my attention to some thorn bushes that he had bought for evergreen hedge plants. They were as bare of leaves as a bean pole and looked like Osage orange bushes. And so I might go on *ad infinitum*.

Now let us take a retrospective view of the operations of these agents. They came into the county as perfect strangers, representing a firm that the people had never heard of, and selling kinds of trees and plants that were mostly unknown, at enormous prices to the poor, hard working farmers who toil early and late to raise wheat at fifty cents a bushel. I ask you in the name of justice if it is not high time some way was devised to stop this wholesale swindling. Such men deserve to be placed in a lower class than the highway robber of the plains. If they had their just deserts they would be keeping company with the Younger boys. I see before me nurserymen whom I know to be honorable men; and I say to you, it is a duty you owe to yourselves as well as your patrons to help hunt down these unprincipled knaves. I say to the farmer, organize neighborhood clubs, send to our home nurserymen for price lists, buy stock of them that they have tested and know to be the hardiest and best, and you will be surprised at the amount of money saved.

We will now give our attention for a few moments to another style of humbugging the lover of fine fruit. You know this is a day of monopolies, and the nurserymen of the country have not been slow to follow the ways of the other fellows. Their usual method is to get possession of the whole stock of some new kind of plant or tree, put an enormous price on it, and then flood the country with special circulars illustrated with pictures of fruit of enormous size and brilliant colors, and setting forth in glowing terms the originator's story of its wonderful productiveness, great hardiness, etc. Ninety-nine times out of a hundred it will prove to the deluded purchaser either an utterly worthless humbug of an old sort with a new name, which might have been bought for a small sum. As examples I might mention the Big Bob strawberry, boomed by a prominent Eastern nurseryman, famous for such operations, who acknowledged the next year that several thousand spurious plants had been sold to him, and sent out by him to his customers. Then there was Fay's Prolific currant; nearly as large as cherries and three times as productive

as Red Dutch, a few of which will be sold for the very low price of one dollar each. Buy a few and save making ladders and climbing cherry trees. If you are fond of grapes, buy the Niagara, a small plant of which you can get for the trifling sum of two dollars. This is said to be the hardiest white grape grown, and will no doubt prove a bonanza to growers in the mild climate of Minnesota, but is pronounced too tender for the cold winters of Kansas.

Surely, with humbugs to right of him, with tree peddlers to left of him, with blizzards behind him, and blight, drought and tornadoes in front of him, the lot of the would-be fruit grower of Minnesota is not an enviable one. And when we see the poor farmer made the victim and prey of every kind of monopoly, we should not wonder to see the boys running away from the old farm and seeking the gilded attractions of the city.

DISCUSSION.

Mr. Harris spoke of the agents of Albaugh as among the class of humbugs mentioned by Mr. Cutler.

Mr. Underwood. Albaugh told me in Chicago, at the convention of nurserymen, a year ago last June, that he was going to send out parties, and sell them just what he wanted to, and furnish them with just what he pleased.

Mr. Tuttle. I would say I think he has picked up the greatest set of liars on the continent. [Laughter.]

On motion, the meeting adjourned until 2 o'clock P. M.

AFTERNOON SESSION.

THURSDAY, JANUARY 21, 1886.

The meeting was called to order at the usual hour by President Smith.

QUESTION BOX.

The following question was read: "Has any person been humbugged by Minnesota nurserymen or sellers of nursery stock with headquarters in this State?"

Mr. Underwood. Mr. President, my impression is that there are a good many who think they have been humbugged by Minnesota nurserymen. When I heard the question read I felt like saying perhaps no one is a bigger humbug than the man who buys anything, don't take care of it, and blames the nurserymen because it dies. There is

probably where the most of the "humbugging" comes in. I think if farmers would all come out and join the State Horticultural Society, help form local societies, and post themselves with regard to the setting and caring for nursery stock, and thus inform themselves so that they would know what they were getting and what they want, the same as they would do if they were buying a horse, they would not have so much occasion to talk about being humbugged by nurserymen. It is well enough to talk about agents, but it is usually wind expended without any beneficial results; you can talk and spout but you never drive the agents out of the country. It is better to put in time talking to farmers. Now, here is our friend Cutler that wasn't humbugged because he knew what he was doing, what he wanted, and was in a position where he could guard himself against humbugs. If there is any complaint anywhere I think the farmers had better go to work and post themselves so that no humbugging game can be practiced upon them.

Col. Stevens. I would suggest that the question be changed to read "Does anyone know whether the farmers have humbugged the nurserymen?" [Laughter.]

Mr. Pearce. A good many years ago I learned this maxim, "Experience teaches in a very dear school, but fools will learn in no other." Now, I am with Mr. Underwood in this matter. If men living in this day and age when the opportunities for informing themselves are so many, allow themselves to be humbugged, I say it is all right that they should be humbugged.

Mr. Barrett. Mr. President, I know that we are infested with agents in our locality, irresponsible men that are doing damage to the cause in which we are engaged. They injure the good reputation that we may have acquired. I don't suppose anything can be done, but some resolution might be passed that would have some moral influence. The organization of horticultural societies has done much to protect the people.

Mr. Fuller. There are certain classes of agents and a certain class of nurserymen, as well, that propose to impose upon the people; the agents of these firms go out for that purpose, and are a class of liars from the beginning to the end. They operate in one part of the country until they fill a large number of their worthless orders and away they go to some other part of the country. Those who buy their worthless stuff say, "I knew he was a humbug, but we couldn't get rid of him." They didn't have spunk enough to set the dog on him,

and so were compelled to give him an order. Nine-tenths of the farmers haven't energy enough to dispose of these agents summarily who visit them for the purpose of lying the thing through. I regard it no better than if they should come with a pistol and pointing it at their breast tell them to stand and deliver; and there are nurserymen that send out that class of agents.

Mr. Underwood. This tree business reminds me of the horse-trading business. We have got lots of men all over the country that are trading horses. They are good enough fellows in their way, but they will get a horse for seventy-five dollars, fix him up a little, and get \$125 to \$200 for him; while probably the horse isn't worth any more than they paid at first. Why don't the horse dealers get up a vigilance committee to see that every man that trades horses doesn't get cheated. I don't think our Society is called upon to act as a vigilance committee. People, as a rule, will take care of themselves, and I think it is wise to let them. Now, if you want to talk to the tree agent, you had better talk to him to his face and give him a chance; he will generally "stay" with you. I don't like to denounce a man when he isn't around. We can't all get honest Smiths for tree peddlers. I wouldn't guarantee to this Society that all our agents are strictly honest; I can't control them, and don't believe there is a man living that can.

President Smith. I will state, gentlemen, that we have a very large program to go through with this afternoon.

Col. Stevens. Before this question of humbugs is disposed of I want to say that I don't think myself, so far as I know, and so far as I have heard, that there has been any objections urged to the ten or fifteen leading nurserymen in the three states of Wisconsin, Minnesota and Iowa, but my friend Underwood I think takes a different position from the one he believed in last summer sometime. My reason for saying so is that I have learned that in McLeod County alone during the past year orders have been given for about \$6,000 worth of "budded fruit trees." The agricultural press is doing what it can; we send out about thirty thousand copies of our paper at every issue. That ought to accomplish something. I believe the fault, so far as we are concerned in Minnesota, is more with the farmers than in the nursery-stock, because they don't take proper care of it.

Mr. Cutler. As it has been insinuated that the farmers are an ignorant class, especially upon this subject, I feel compelled to state a circumstance that occurred in our county (McLeod). A gentleman

came to my place claiming to represent the Jewell Nursery Co., of Lake City, and stated that he had been down in Kansas. I think he said his name was Ambrose; that he had written to the "old man," as he called him, (I suppose he meant Mr. Emery) and told him if they would allow him to work the budded-fruit dodge through there upon the farmers he could make it pay well. He took out a letter and read from it: "We do not propose to place a club in your hands to beat our own brains out." Those were the words which he claimed to have received from the Jewell Nursery Co. This same agent also stated to one of my neighbors, who gave him a large order for forest trees,—some 2,300 I think—the games that he practiced upon the farmers of Kansas to get their orders; and he replied that he didn't want him to try to work any such games upon him. It has been suggested that the farmers should attend the horticultural societies, but it is very difficult for a large part of the farmers to leave their business at home. Furthermore, these agents work up some new device each year.

ANNUAL ELECTION OF OFFICERS.

President Smith announced the next business in order the election of officers for the ensuing year.

The following officers were then elected:

President—Wyman Elliot, Minneapolis.

Vice Presidents—Messrs. A. W. Sias, Rochester; E. H. S. Dartt, Owatonna; M. Cutler, Sumter; F. G. Gould, Minneapolis; and G. W. Fuller, Litchfield.

Secretary—S. D. Hillman, Minneapolis.

Treasurer—J. T. Grimes, Minneapolis.

Executive Committee—J. S. Harris, chairman, La Crescent; J. M. Underwood, Lake City; Truman M. Smith, St. Paul; Ditus Day, Farmington, and M. Pearce, Minneapolis.

Librarian—E. A. Cuzner, Minneapolis.

Entomologist—O. W. Oestlund, Minneapolis.

The following were named as a Committee on Publication: Col. J. H. Stevens, C. L. Smith, and S. D. Hillman.

On motion of Mr. Cutler, the President was instructed to appoint a committee of from one to three, according to the condition of the treasury, to visit the blackberry plantations of Mr. Hamilton, of Ripon Wis., the coming season, and report to this Society, at its next annual meeting.

On motion it was ordered that hereafter the President and Secretary shall hold their offices and discharge their respective duties during the entire session of the Society at which their successors shall be elected.

Mr. Cutler offered the following resolution :

Resolved. That each member of this Society be constituted a committee of one to notify the Secretary of this Society of any operations of swindling tree agents, the Secretary to furnish the names of such agents to be published in the principal papers of the State.

President Smith. While the the resolution in its spirit is good, in carrying it out there may be danger of getting this Society into a good deal of trouble, and rendering the Secretary liable to be prosecuted for libel. Some man may think he has been swindled when he has not, and we may have some vexatious and expensive litigation on our hands. I think we had better keep clear of it; do all we can to inform the people, but not in such a way as will get ourselves into any legal trouble.

A Member. I think the best way is to let the farmers learn by experience. It may take some time and cost them something to learn, but if they want trees, it is better for them to go to some responsible nursery for them, and they will avoid being humbugged.

Mr. Gould. The motion is, as I understand, that each member is to send names of agents that they may regard as doing a swindling business, to the Secretary, who shall publish the names in the leading newspapers. This would certainly involve the Society in litigation; libel suits are very common nowadays, and they are suits for big damages. I think we had better be a little cautious.

On motion of Mr. Pearce the resolution was laid on the table.

Mr. Cutler. I have one more resolution that I will offer:

Resolved. That this Society hereby advises the people of the State to give the agents claiming to represent the claims of nurseries of Albaugh & Co., a wide berth.

Mr. Underwood. I don't see why this Society should want to pitch into any nursery. I think we had better disseminate what knowledge we have and let the nurserymen alone. I wouldn't care how much you pitch into me, but I don't like to see my brother nurserymen abused. I don't think it is the business of this Society to take up cudgels of this kind. Col. Stevens will publish in the *Farm, Stock and Home* anything in the way of complaints that may be made, and so will other agricultural papers, and you can blow our nursery or any other nursery, of Ohio or New York all you want to.

Mr. Sias. Mr. President, this is a subject that I never have spoken on, but I believe it is a principle that ought to be acted upon that the strong should help protect the weak, as far as they can, consistently.

Now, our Society has been teaching us for nearly twenty years how to protect ourselves. We have been posting ourselves, and guarding ourselves against humbuggery. We don't need to do anything to guard Mr. Underwood, but there are a great many farmers that never come into these meetings, and many of them live so far away that they can't get here. I have been here a good many sessions, and try to do a little something to guard against humbuggery. Some of our best members don't believe in stirring up these things; it is true we have always had enough regular business on our program, but I would like to see this resolution pass; I believe we ought to do something to show these irresponsible agents and foreign tree venders that we are not to be imposed upon. They are hurting Mr. Underwood; they are hurting me and every man that is trying to do an honest business in this State. They are doing probably nine-tenths of the business in this State. They are bringing in trees mostly from Ohio and New York. Their trees, as a rule, are good for nothing, for this climate. If we submit to it, why it will go on, and the farmers will call us humbugs.

Mr. Gould. I don't see how in the world the farmers are going to distinguish between the agents of the different nurseries. I think there are honest men in the nursery and tree business, as well as some humbugs in that business. Now, I wouldn't draw any line between them in a public way. I think it is entirely out of place. I think the tree-peddler is a civilizer. I believe that he and the Methodist preacher go hand in hand; [Laughter] he is a horticultural colporteur. He spreads a knowledge of fruits and flowers among the farmers and makes their families happy. I believe one is about as important as the other.

Mr. Latham. I do not see the use of publishing the resolution after everybody in the State have purchased their trees; these agents are going through the country all the time; everybody will have bought their trees and have them planted before our report is published, and if it is determined to pass such a resolution at all, I move to amend the resolution by requesting the press to publish it over the signatures of the officers of this Society, and have it done to-morrow.

Mr. Pearce. These agents will probably sell just as many trees, and we may possibly get ourselves into a lawsuit. Suppose we got into court. It would be like this: Witness would say, "I know nothing about it; but I presume it is true." Hearsay testimony don't count with the courts.

Mr. Harris. We have given this matter a pretty good airing by the discussion we have had, and I suppose some of it will get into the daily papers; I think that is all we ought to do.

The question on the adoption of the resolution was then taken and lost; ayes 15, nays 16.

The following communication from Hon. William G. LeDuc, of Hastings, Ex-Commissioner of Agriculture, was received and placed on file for publication:

THE NEW AGRICULTURE.

HASTINGS, MINN., January 18, 1886.

S. D. Hillman, Secretary, etc.

DEAR SIR:—A severe cold (or what is usually understood as such) has for the past ten days kept me at home closely and will prevent my attendance at the meeting of our Minnesota Horticultural Society commencing to-morrow. I promised you if nothing prevented I would be in attendance and take part in the proceedings. As I do not think it prudent to attend in person the nearest approach I can make is to submit in writing briefly some few thoughts pertinent to the matter that will be under discussion.

It may have come to the notice (in a general way) of some, perhaps all the members of the Society that the system of drainage, irrigation, and ventilation, affecting the roots of trees and plants has been proposed and indeed carried into practice with very remarkable results by Hon. A. M. Cole of New York state, a system to what he gives the name of "The New Agriculture" and which he fully describes in a book, of that title, recently published. Mr. Cole claims that by his system, the soil may be made to produce ten times as much, as by ordinary cultivation. His claims, submitted to personal examination and criticism of some of the best and most conservative farmers of his state, men like himself advanced in years and cautiously wise with a lifetime experience, have been favorably endorsed and approved. The soil he selected for his trial field was a few acres, sloping to the East; included 4 feet in 100; a clay loam more or less stony, with a compact subsoil which his workmen in digging the necessary trenches found tough and solid enough to make it slow pick work. This was poorer than the average of a very poor field of which it formed a part.

Along the face of this slope, trenches were dug four feet deep and two feet in width, following the superficial curvature of the slope but maintaining the depth from the surface and also the level of the bottom of the trench from end to end. This trench he filled with stones of all sizes and kinds to within fifteen inches of the general surface of the slope, then covered with flat stones carefully laid to prevent the interstices being filled with soil and on the top of the flat stones placed coarse refuse, material of any kind, grass, stalks, weeds, anything to hold back the earth. This ditch was in effect a reservoir to hold back the water from melting snow, or rains. The stones serve to support the earth covering the reservoir. At a distance of a few rods, a parallel ditch was dug of exactly similar character filled and covered in the same manner, and these two ditches were connected by transverse ditches constructed in the same manner only smaller, leading however from the upper ditch about a foot from the surface, the effect of these shallow transverse ditches being to carry off any overflow or surplus water in the ditch

above. Other parallel ditches connected by transverse ditches were constructed to the bottom of the slope intended to be cultivated. The earth was then thoroughly cultivated over and between and nearly as deep as the top of the ditches. The grounds thus prepared by Mr. Cole for his first experiment were two acres in extent, which was planted mostly to strawberries. The results appear to have been so remarkable as to challenge the credulity of those who had not made personal examination. A visitor who inspected carefully Mr. Cole's place on the 7th of July last, writes concerning these strawberry plants, which were planted in Oct. 1884. "I never saw anything like it. There was a full crop of most remarkable berries, remarkable in size, color and quality, the yield was certainly very large; one plant of older setting, had enough berries I thought to fill my hat, if all ripe and green had been picked at one time; and there was no core, no stem, they were tender and juicy all the way through—not good berries to transport a long distance to market, and the foliage was wonderful. I measured one leaf that was five and a half inches across. An apple tree standing in this improved land reported as worthless, its fruit gnarled and valueless, before the land was trenched, is now bearing largely and its fruit of fine quality." Another visitor reported the results were astonishing both as to the size of the fruit and the quantity produced. It is no exaggeration to say that more strawberries per acre in bushels can be grown by Mr. Cole's new agriculture than the old agriculture can produce of potatoes under the most favorable circumstances. Another advantage claimed by Mr. Cole for his method is that in the locality in which he resides, it furnishes a constant supply and flow of pure spring water from the lowest trench, and that in the coldest weather the surface of the soil only is frozen, that frost will not be able to penetrate to any depth beyond a few inches, because of the constant flow of spring water.

In calling the attention of this Society to this New Agriculture of Mr. Cole, I prefer to state the bare facts and leave to each one such application or inferences as may seem proper. That it is a new departure well worthy of careful examination and experiment is certain. It also occurs to me that a statement of another method of irrigation, which I saw in use in California orchards in 1883 might prove of interest, possibly of value, to some of the younger and more enterprising members who desire to experiment in this direction. And it is my opinion that by the profuse use of water in our gardens and orchards we can very largely increase the profits of our lands and labors.

IRRIGATION IN CALIFORNIA.

An enterprising California fruit grower laid pipes made of cement and sand underground through his entire garden and orchard grounds, which were between Sacramento and San Francisco, where the rainfall is usually sufficient to secure a good crop of fruit. By means of these pipes he was able to keep the trees supplied with any amount of moisture desirable; by drawing a plug he could water any four trees in any part of his orchard. The pipes being porous, leaked the water slowly when kept full and thus kept a constant equable supply ever present to the whole area in which the pipes were laid. The quantity of his fruits was largely increased and the appearance and quality improved, and he was able to command higher prices for his product than other growers. This success led to the introduction of the system in the more arid parts of California, and the finest orchard of oranges, lemons, limes and olives I saw anywhere on the west coast, was near the southern limit of the

belt of extra tropical rains and where the influence of irrigation was most strikingly manifest in the luxurient growth of trees and fruit. This orchard irrigated by the subterranean system of cement pipes, was 18 to 20 acres, the flat on top of a ridge which outside of the irrigated area was as barren as a travelled highway in midsummer. The water was raised by wind power and managed from the tanks by one man, only a part of whose time was required daily to do the same work that required two and sometimes three men one week in each month. Having for a long time been of opinion that even in our favored land we could profit by a judicious use of water, I had hoped some parties interested in gardening or orcharding might make some experiments in irrigation and report them to the Society. I know that some few persons have watered patches of berries in an unmethodical manner and without keeping any accurate record, and have acknowledged the benefits accruing therefrom, but no one in our State or so far as I know, in any part of the United States east of the 100th meridian of longitude, systematically applied water to the specific use of increasing the profits of farming, except Mr. Cole, who in the dry weather last season put a team at hauling water from the Vermillion, one quarter of a mile and thoroughly soaked strips about twenty feet wide through a strawberry patch one quarter of an acre in extent; the team was employed three days at one time and two at another, and the results were so satisfactory that I will, if possible, irrigate this year in systematic manner so much of my garden grounds as I can, and should any member of the Society desire any further information as to making the concrete and laying the pipes for sub-irrigation, I will be pleased to give them in detail any information possessed by myself. It occurs to me that a garden plat underdrained in this manner by pipes, could be raised in temperature in early spring or late fall by filling the pipes with hot water, the advantages of which will be apparent to all.

It should be remembered that an improper use of water may prove not only detrimental but also sometimes disastrous. Thus, surface irrigation of a clay soil in mid-summer may harden the surface and render it impervious to the air, light and moisture necessary to the vitality of the tree or plants, or too great a supply of water in loose, friable, spongy soils may induce the roots to take up a larger supply than the tree can safely use, thus enfeebling the tissues and weakening its vitality so that it may suffer and possibly die under the heats of our sometime torrid summers; but this whole subject is one which I am sure is worthy the careful examination and attention of our horticulturists and farmers, and to them I desire to commend its practice experimentally.

On motion, the meeting adjourned until 7 o'clock P. M.

EVENING SESSION.

THURSDAY, JANUARY 21, 1886.

The meeting was called to order at the usual hour, President Smith in the chair.

The committee on the President's Annual Address presented the following:

REPORT OF PRESIDENT'S ANNUAL ADDRESS.

Mr. President and Members of the Minnesota State Horticultural Society:

Your committee on the President's Address beg leave to make the following report on those points that they consider of most importance to the future welfare of this Society.

The attention of members is called particularly to the question of our finances so ably explained by our worthy President. By instructing our treasurer to comply with the requirements of the State auditor to use the reserve fund (set aside for the paying of premiums on long keeping seedlings of good quality,) our Society can have money to carry on its work this year; and, when the legislature meets, we can have our laws so changed that we can set apart a portion of our yearly appropriation for a sinking fund to pay premiums of the future, for long keeping seedling apples. We recommend the appointment of a representative to the American Horticultural Society at its next annual meeting, and the paying of his travelling expenses, without any salary attached to the position for services so rendered. A full report from such delegate will be expected at our next annual meeting. A committee on legislation, as suggested, is very necessary in order that they may determine as to necessary legislation in the interests of this Society before its next winter meeting; and the committee should be appointed at the present time. The committee should consist of not more than three in number and be centrally located, where they can confer with each other without great expense to the Society; and if members will communicate with them and make such suggestions on legislation as they may deem proper it would no doubt redound to the interest of our Society.

The suggestion in regard to the premium list on horticultural products being made out early and presented to the State Board of Agriculture, is a good one and it is hoped our Executive Committee will act promptly in this matter, taking the suggestions of our worthy President as a guide in their deliberations.

We heartily endorse the suggestions made concerning the proposed Summer Meeting at our State Experimental Farm, under the management of Prof. E. D. Porter.

We approve the suggestion of the President, that instead of offering agricultural papers we give a membership fee in the Society at the coming June meeting, on second, third or fourth premiums, for the sum of one dollar.

WYMAN ELLIOT,
J. S. HARRIS,
A. W. SIAS,
Committee.

Mr. Sias here took the chair, and President Smith offered a resolution that the incoming president be chairman of the Legislative Committee of three, and that he be authorized to appoint the other two members of that committee.

Adopted.

On motion of Mr. Cutler it was voted that the Society accept the invitation of Prof. Porter, that the Summer Meeting be held at the University Experimental Farm.

Mr. Harris, from the committee on Districting the State presented a report which was adopted:

DISTRICTING THE STATE.

Your committee appointed at the Annual Meeting, in January, 1885, to divide the State into fruit districts, following the plan adopted by the Iowa State Horticultural Society, would respectfully report that after due consideration they deem it inadvisable at the present time to make any change in the system now in use by our Society.

J. S. HARRIS,
WYMAN ELLIOT,
Committee.

The following paper was then read:

THE CULTIVATION AND ADORNMENT OF SCHOOL GROUNDS.

By MRS. C. O. VAN CLEVE, Minneapolis.

Mr. President:—

The subject assigned to me on this occasion is of great interest to all of us, and it is gratifying to all who have at heart the best interests of the rising generation to have it brought before the Society. I am to speak now of the beneficial effects of cultivating and adorning our school grounds, and making them a factor in the education of our children. The best way to carry this measure into effect is for after-thought and discussion.

Not only would our school houses look more attractive in the midst of beautiful flowers and ornamental trees and shrubs, and become an element of beauty to cheer and gratify the passers by, but upon the children of the schools the moral effect would be most salutary. Children learn many things at school that are not in the text books, and the eye takes in much that has power in forming habits and in waking up aptitudes.

And there is something elevating, refining and improving in surroundings of this kind; the impressions made on young minds through such channels, though perhaps not fully realized at the time, are lasting as life. Very many influences are conveyed imperceptibly to the mind and heart through what we see from day to day; the truth of this assertion all will acknowledge. There is a story, which may be familiar to many, of a farmer's son, who, brought up far away from the sea or other navigable water, in poverty, obliged to work hard every day, having little time to read and scarcely anything to divert or amuse him, developed an intense desire to go to sea and urged this so strongly that his parents consented. But it was a matter of wonder to them when and how he had imbibed such taste, as there seemed nothing about his home or associations to inspire or foster them. At length, the mother's eye lighted upon an old cheap picture which had hung over the mantel piece for years and had become very dim and indistinct in the smoke and dust, representing a ship at sea, tossing on the billows in a storm, and she felt that this picture had been the boy's inspiration, that imperceptibly there had come into his mind through its influence his ardent desire to be a sailor. Picture the tired boy as coming in from his labors and sitting by the ample fire place, drawing in comfort and cheer from the blazing logs, and ever and anon contemplating the one poor decoration of his humble home, till it awoke in his breast inclinations that took full possession of him, gave him an intense longing for a "life on the ocean wave" and shaped his whole future life.

Then think of the many children who come to our schools from bare, desolate homes, whose only hours of ease and comfort are those spent in and about the school house, whose only opportunity for receiving good impressions is the time spent at school, and try to realize what a powerful influence on their lives might be the beautiful, restful surroundings in these cultivated school yards and grounds. Many children will go out into the world empty handed to fight the great battle of life as best they may; some will be established in business by fathers able to give them a start, but all will be exposed to temptation, and the impressions received while at school will have much to do in forming their characters for good or ill. When tempted to go astray they may be influenced by the sweet memories of their

happy school days, and the sight of some tree or flower such as grew in the old school yard may call up the innocence of those days, and the salutary teachings received there, and save them from sin.

A poor creature had fallen into a drunken sleep on the steps of a building in St. Petersburg, Russia. A saintly woman who had been carrying flowers to the sick in hospitals, passed that way, and stopped to look in tender pity on the poor, sinful girl. She would not waken her, but taking from her basket two or three pansies, left over from her work, she laid them tenderly on her breast and went on her way with a prayer in her heart for her poor lost sister. Hours after, arousing from her stupor the girl found them there, and burst into tears at the sight. She wailed out, "The morning I left home to find work in this great city, my mother gave me a bunch of pansies, and God must have sent them to me to call me back to my home, I will arise and go to my mother." And we read that she was saved and became a good, true woman.

A few years ago, a young man lay dying in this city; he was going out in the dark, he did not know the way. Christian friends labored lovingly with him and urged him to give his poor broken heart to the blessed sympathizer; they grew to love the poor boy, far from home and friends, but could not seem to touch him, till one day a lady gave him a few geranium leaves to cheer him. As he took them in his poor wasted hands, and drew in their fragrance his heart melted, tears came, and in broken tones he sobbed out "Mother had a geranium in her window at home and this smells like it." Remembering then his mother's undying love and her gentle teachings, he gave himself into the arms of the pitying Heavenly Father, owned his need of him, and died trusting in his Savior, while the leaves were in his hand.

We can all remember the story of Azim, the tempted youth in Moore's beautiful romance of "Lalla Rookh," who was kept from temptation by memories of flowers called up by the sweet song:

There's a bower of roses by Bendemeer's stream,
And the nightingale sings round it all the day long;
In the time of my childhood 'twas like a sweet dream,
To sit in the roses and hear the birds sing.

That bower and its music I never forget,
And oft when alone in the bloom of the year,
I think—"is the nightingale singing there yet?
Are the roses still bright by the calm Bendemeer?"

No, the roses soon withered that hung o'er the wave,
But some blossoms were gathered while freshly they shone,
And a dew was distilled from their flowers that gave
All the fragrance of summer, when summer was gone.

Thus memory draws from delight ere it dies,
An essence that breathes of it many a year,
Thus bright to my soul, as 'twas then to my eyes
Is that bower on the banks of the calm Bendemeer.

These few instances may suffice to show the salutary effects of "Nature's silent teachers," and now the question is, how may this idea of surrounding our school houses with beautiful things be carried out?

Although many will admit that it would be of lasting benefit to our children, yet doubtless some objections may be raised by practical people who can see no use in all this.

The first objection raised will probably be that such grounds as are proposed could not be kept in order, the children in their plays would destroy them. Well, that has weight, but in laying out the grounds, a part could be reserved for a stamping ground where the boisterousness might be worked off, for we who have brought up children know they must have a chance to romp and make a noise, and we would not entirely restrain this bubbling over of animal spirits, but a part of the plan proposed would be to teach them to respect the rights of others, and a pride in the ornamentation of their school surroundings could be so encouraged, that they would feel a sort of ownership in them and would foster the beautiful things and guard them from harm. In a township near Columbus, Ohio, an acre or more of ground surrounds each school house in which are various kinds of trees, shrubs and evergreens and a teacher is made responsible for the preservation of the plant and trees. A plan is proposed by an old school teacher in that state that might work well here: "At a certain time of the year suitable for the purpose, there should be an Arbor day and the trees should be planted by the pupils, who would feel a sort of interest in them and protect rather than destroy them"—there too the girls might have flower beds and plant seeds, set out roots and slips under wise guidance, thus all would learn much of tree culture, of the habits of various plants, and botany would thus be taught in a most practical way. This plan, too, would train and educate a great army of helpers in our horticultural societies, who would understand thoroughly what can only be learned by practice and experience, and would be prepared to give to the public the benefit of their knowledge.

I have thought there might be auxiliary horticultural societies in our schools from which should come delegates to our regular meetings, bringing reports of their work, the preparation of which reports would be of great benefit to the young people, and, it may be the older ones could gain some hints from the experience, the successes and failures of the children. Such auxiliaries properly organized would be exceedingly stimulating, and the officers would carefully guard these experimental school gardens from depredations.

In the care of children, I have noticed that giving them something to do and holding them responsible for the doing of it, making them feel that it is their work entirely, acts most beneficially, and while learning lessons which would do them good all their lives, from this work proposed for them, they would be fitting up little parks all about us, thus conferring great pleasure and benefit upon the whole community. And not least among the benefits to be derived from this scheme, would be furnishing occupation for leisure hours and leaving no time or room for that mischief which wise old Dr. Watts tells us "Satan finds for idle hands to do." Then as a measure for encouraging in our children a love of nature's beauties; for promoting and stimulating pure healthful thoughts and inclinations; for awaking up feelings and impulses which make lasting impressions for good on the young lives for whose future we are in a measure responsible, and for lighting up our

beloved State with bits of brightness and beauty which shall be a joy forever; let us, as a Society, exert our influence in this matter of cultivating and adorning the play grounds, where our children spend so much of their time and where they are receiving impressions which shall be as lasting as their lives.

And permit me to say a few words on a subject not down in the bills, I mean the adornment of our railroad stations.

Who has not felt the restful, cheering effect of the miniature parks bright with flowers and foliage, to be seen at the stations on some of our roads? Why may not these refreshments for the eye become general?

They would be very little expense, the station agent could oversee them, and in most cases would enjoy doing so, for his own pleasure and that of his family. And who knows but some weary traveler may be reminded by a pretty, fragrant flower of home and mother's teachings, and turn away from the saloon right across the way? A less thing than a flower has been used as the agency to save a man from ruin. Have you read the exquisite tale of "Picciola" by Sanitine? if not I pray you do so as soon as you can.

It is the story of a French Count who languished for years in a prison on account of his political views, during the reign of Napoleon the Great. He was hardened against kindly influence, despairing and bitter, and had lost faith in God and man. One day walking back and forth in the narrow court yard, with nothing to interest him, a prey to his gloomy thoughts, his head cast down, he began to count the stones in the walk by way of diversion, and perceived a little mound of earth raised between the stones and slightly opened at the top. So monotonous and bare was his lonely life, that this change, insignificant as it was startled him; he grew excited wondering what it meant. Stooping over the little mound, he very carefully removed some particles of earth and saw a feeble specimen of vegetation with scarcely strength to sprout, weak and languishing; he was about to crush it with his heel, when a fresh breeze wafted to him the perfume of honeysuckle and heather, and checked the act, with the thought that some day, this little embryo might have perfume to give him. Then he began to reason, how was it possible for that minute plant so weak, so soft, so fragile, to throw out that earth, dried and hardened by the sun. He became interested, examined it more closely, saw how its first leaves were protected by a sort of double fleshy valve, so that nothing could injure them, and his mind was awakened and turned out of his gloomy thoughts. And the story of how day by day, he watched that plant expand, how tenderly he nurtured and watered it, how he grew to love it with the devotion of a lover, and how it became to him an evangel, lifting up his heart to the God whom he had denied, giving him patience to endure and inspiring him with hope, and how in some way his beloved "Picciola" was instrumental in his restoration to freedom and great happiness, is most touching and fascinating.

For beauty of style, ingenuity of method, purity of sentiment and sound convincing argument on the reality and power of the Christian faith, it has no equal in uninspired literature and should have a conspicuous place in every horticultural library.

And now if the premises in the foregoing are correct, it seems clear that a part of our duty as a Horticultural Society, is to implant and foster in the minds of our youth a genuine intelligent love for the culture of plants, and the plan suggested

for the adornment of school grounds would, if carried out, be a most efficient means of accomplishing this desirable end. Hoping that some abler pen and more eloquent tongue than mine, will take up the cause and so represent it, that at our next annual meeting we may point to actual and satisfactory results, I leave the subject in the hands of the Society, with earnest wishes for its steady growth and increasing usefulness.

On motion the editors of *Farm, Stock and Home* were requested to publish Mrs. Van Cleve's address entire, as soon as they can find room to do so in their paper.

The following paper was then read:

FRUIT CULTURE IN SOUTHERN DAKOTA.

By MRS. L. A. ALDERMAN, Hurley, Dak.

Mr. President and Members of the Minnesota Horticultural Society:—

Your Secretary having requested of me a report of the progress made in fruit culture in Dakota, I shall first escape, prefacing my remarks with an apology, by stating that I greatly regret being prevented, by unavoidable circumstances, from securing more thorough information on the subject treated, that possibly I might give you approximate value for your time trespassed upon.

You will readily guess that we in Dakota have not escaped the tidal wave of disaster that has overtaken the horticultural interests of the country, and which in the northwest have threatened to dethrone Pomona herself.

Doubtless Minnesota has suffered more than we, owing to her orchards being older and exhausted by fruiting, but here, as there, we, as horticulturists are anxiously asking "What of the night?"

Saying nothing of the thousand worthless trees shipped in by the tree-venders, whose death was a foregone conclusion, there were a few sorts popularly called "Ironclad" that we had fondly hoped to acclimate; among them were Haas, Pewaukee, Wolf River, Mann, Plumb Cider, Utters, Red Astrichan and others of like hardiness, these are our failures. Among those of not altogether broken promise are the Fameuse and Walbridge, although this is very near the northwestern limit of their usefulness.

With us, as with you, the Wealthy and Duchess seem to be the sheet anchor of our Pomology, and I give them in the order of their value and hardiness as exemplified on our own ground; and from advices received I am led to infer that this was true of most parts of our Territory, yet not universally so. When we have solved all of nature's mysteries pertaining to fruit raising we shall know what manner of soil and location are best suited to the needs of each variety, and then we shall know why these things are so. In this connection I will mention that the well-known fact that large rivers or other bodies of water make favorable conditions for fruit raising is exemplified along our southern border where the ameliorating influence of the great Missouri makes success possible with a line of fruit quite unknown beyond its softening influence; indeed a moderate success has been met with in peach

raising. In Yankton I have seen peach trees loaded with their luscious fruit, and I am told that in Bon Homme County the Northern Spy and other apples of the extreme East are raised. But one cannot judge of Dakota proper as a fruit growing territory by this narrow strip skirting her extreme southern border, and excepting the Duchess and Wealthy, I know of no standard apple that is a pronounced success in the territory at large. True, the Haas, Walbridge, Fameuse, Pewaukee, and even Ben Davis have been fruited here, and other sorts that the owners could not designate, but as a rule, their days were few and full of trouble.

Yet nowhere do the apples that are a success attain a greater perfection than here; perhaps I cannot better illustrate the adaptability of the Duchess and Wealthy to our condition than to mention that on our grounds a Duchess six years old, five and one-half feet high, perfected thirty-two fine specimens of fruit; also, that a limb of a Wealthy one year old matured sixteen well developed apples, said limb being but one-half inch in diameter; it is but fair to state that this limb bore most of the fruit of the tree.

In an orchard of eight hundred young Wealthys four years old, quite a per cent of the trees displayed blossoms and numbers of them bore one, two and three apples, the wonder and admiration of all who saw them. Mere bushes with tiny whip-like branches terminating in a luscious apple that would have tempted Eve herself.

With the Duchess, Wealthy and the Hybrids, headed by Whitney's No. 20, supplimented with the fittest of the Russians, when their fitness shall be proven, and the new sorts that your own Gideon, Sias, Harris and others are developing for us, it is no wild dream of the visionary enthusiast to believe that we shall shortly have a line of apples whose perfection leaves nothing to be desired.

Apropos of this, the record of the Whitney No. 20, as a tree for Dakota planting is worthy of special mention, having passed through the last two winters unharmed. Our most remarkable fall just passed has also failed to lower its record. On the night of the fourth of September last, ice formed one-half of an inch thick, this being our first frost of the season, being followed on the sixth by a warm, copious rain, and conditions most favorable to plant growth during the remainder of the month. October fifth was ushered in with another solid freeze; it being our second frost, the result was most disastrous to tree life. Young native plum trees that had made a rank growth were killed to the ground. The Wisconsin Weeping Willow on low ground having grown most luxuriantly was also dead; the effect on the White Willows were most noticeable, being killed on low ground but unharmed on the higher land. The effect on the tenderer sorts of the apple family was more or less discoloration of the season's growth.

Our orchards have been comparatively free from insect pests, but already the blight has worked great injury. This is especially true where the orchards have been literally cremated in oven-like enclosures of tall cottonwood, or other forest trees. Still the Siberian and Russians are not exempt on any site and doubtless the propagation of many of them will have to be abandoned for this reason; notably the well-known Hyslop and Transcendent; but for this the Hyslop would be a great success here, bearing early and abundantly such fine fruit as to cause those familiar with it in the East to doubt its identity.

Our soil seems peculiarly suited to grape culture of the hardy sorts. Mr. Terwilliger of the County of Turner has met with most flattering success in grape growing

on what would be considered an unfavorable location; being on rich bottom land, but a dense grove of cottonwood just north of his vineyard seems to make the location perfect if success is the criterion. Mr. Terwilliger stated at the meeting of our Horticultural Society that in sending grapes to Fredonia, N. Y., to be named he had repeatedly been told that he grew finer specimens of the same variety than they could produce there. And by the way, Janesville grapes raised by this gentlemen took the first premium at Minnesota State fair some four or five years ago; he this year fruited nineteen different varieties of grapes and has thirty-five sorts growing, has excellent success with Janesville, Worden, several of Rogers, Hybrids, Moore's Early and the Lady; still the ordinary care, or lack of care, which our vines receive will not insure success with grapes of even the Concord type of hardiness and the Janesville promises to be the most valuable grape for Dakota yet produced. I have not yet known of an instance of its being affected by mildew, our drier air preventing this tendency perhaps.

Cherries are among the uncertainties of our horticultural products. In the river fruit-belt they are a moderate success; outside of this they are not reliable, although on our grounds forty trees of the Early Richmond variety have stood the test of eight years without injury until a belated freeze in May last nearly killed them just as their buds were swelling into active life.

The plums that are useful to us are of course the best of the wild ones; our Desota and Forest Garden heading the list. Of the smaller fruits, the currant and gooseberry are an assured success. Of raspberries, the blackcaps are a partial failure without winter protection. Among the red the Turner has perhaps given a better equivalent for money invested than any fruit planted by Dakotians. When once it has taken root, it is as tenacious of life as is the prairie grass itself, and will yield some fruit even with absolute neglect, although it then gives hardly a hint of its great possibilities. The Cuthbert has been tried but is not hardy, and needs winter covering. Strawberries find a congenial home on our Dakota prairies, and nowhere can they be found in finer perfection, indeed our responsive soil and hot summers seem to be peculiarly fitted to produce vegetation of almost tropical luxuriance, and fruits of the finest flavor and superior size.

Although not coming under the head of fruit culture the Flora of Dakota is worthy of more than a passing notice, commencing with the "Wind flower" a species of *Anemone* that comes up in the earliest spring, dotting the prairie with what are in effect tulip-like flowers (the flower so called being really the colored calyx of the flower). We have a succession of most beautiful prairie flowers till frost, many of them quite worthy of cultivation. In our ravines and along streams the Bitter Sweet, American Ivy, Hop and wild Clematis revel in tangled luxuriance. Of cultivated shrubs the half-hardy ones are just tender enough for the Dakota planter to escape success with them, but some of the most beautiful roses, as the Moss, many of the Hybrid Perpetuate and not a few of the older sorts flourish here, and while the edict of the ice king has gone forth forbidding us the half hardy pets of the eastern garden, nature offers no insurmountable obstacle, and the possibilities are wholly within our grasp of making in Dakota, without noticeable lack of fruit, flowers or vegetable products, the grandest of American homes, which in the best sense are the grandest in the world.

The following report was then presented by Prof. N. H. Winchell of Minneapolis.

ENTOMOLOGIST'S REPORT.

MINNEAPOLIS, MINN., Jan. 19, 1886.

To the Minnesota Horticultural Society.

Your partiality, a year ago, elected me, as a member of this Society, to the position of State Entomologist. This was done in spite of my protestation of inability to discharge the duties of the position. I can barely distinguish a coliopter from an aphis, besides, my hands are more than full of fossils, minerals and rock-strata, not to mention soils, clays, mineral waters and building stones. I am weighted down; and sometimes I feel as if I should be swamped.

Yet I do not want to ignore the action of this important Society, nor to decline ungratefully the honor which you thrust upon me. In pursuance of the resolutions of the Society some action was taken toward the proper legislation to make a permanent foundation for entomological work in the State, and I wish here simply to relate those steps, as a kind of executive report, and to refer you to Mr. Oestlund for more special facts relating to the entomology proper of the State.

The resolutions adopted last year were as follows :

Resolved. That it is the sense of this Society that there should be appointed, and maintained, a state entomologist, a resident of the State, who should be authorized and instructed to disseminate useful information to the fruit growers and farmers of the State, respecting insects injurious to vegetation.

Resolved. That the legislature now in session be requested to make the necessary provision by the enactment of the necessary law to carry out this plan, and by the appropriation of the sum of one thousand dollars per annum for that purpose.

Resolved. That it is the sense of this Society that the information desired should emanate from the State University, and that such published information should be as rapidly and cheaply supplied as possible with correctness and thoroughness.

In accordance with these resolutions a bill was introduced in the House of Representatives of the last legislature, intended to answer the demands of the fruit growers, appropriating the sum of one thousand dollars per annum. It was referred to the proper committee, but when it came up for final action it was indefinitely postponed. Although there was a committee of this Society appointed to confer with members of the legislature respecting it, yet it does not seem to have been fairly presented before any committee, and was simply ignored from lack of active friends.

Still, though this effort failed, all was not lost. Through the agency of the geological and natural history survey, in previous years, some investigation in the entomology of the State had been carried on by Mr. Allen Whitman, and some valuable reports on the Rocky Mountain locust, by Mr. Whitman were published in the annual reports of the survey in 1876 and 1877. I brought the matter again before the Board of Regents, and recommended the resumption of entomological work, at least in some directions. The funds of the survey do not warrant the full equipment of this department, and it was not possible to employ a man fully and only on entomology. Mr. Oestlund was appointed to serve as a general aid in the laboratory of the survey, and in the museum, with the instructions to be engaged on all occasions when his time and other work would permit, in his favorite pursuit of ento-

mology. He had made a series of observations and many collections during the previous summer, on the insect injuries to the cabbage, under the direction of Prof. Porter, at the Experimental Farm of the State University. The observations were put into completed form and were published in the annual report of the survey for 1884. I have had some favorable comments on the quality of that work from entomologists of other states. In the forthcoming annual report of the survey for 1885, he will have a paper on the aphidæ of the State, with some original observations and notes on new species. If the Society desire a wide dissemination of these notes among its members and all fruit-growers, it might be well to have them printed in the annual report of this Society. The paper which Mr. Oestlund will present at this meeting of the Society will give some interesting facts on the biology of the aphidæ, the result of his work in the laboratory of the survey.

Now, I have a few reflections, and simple recommendations to make touching the prosecution of this work. It is obviously a *desideratum* with the Society that this investigation continue. It is calculated to give valuable information to the horticulturists of the state. It is at your instance that more elaborate study is given to entomology than heretofore. It is but just, then, that you should share in the cost.

These investigations require time and patience. They can only be carried on by the aid of apparatus for collecting, for examination and preservation. They demand a wide range of reference to books, for comparison and determination of species. As has been said the funds of the survey will not admit of the full equipment of this department. Some examinations have to be delayed, and some have to be omitted entirely, from lack of authorities and descriptions which have before been published. The literature of entomology is very great, and it should be at the command of the student. No scientific investigator will work in the dark, and travel over ground which has been gone over by others. At least he should not be compelled to, when his predecessors' results have all been published for his information.

It is, therefore, in my opinion, not asking too much of you to suggest that you set aside the sum of \$100 for the purchase of some necessary books and pamphlets for the use of the entomologist. These can be added to your Society library, now on deposit at the Agricultural College building, and they would not only increase the value of your collection, but would be accessible to all who desire to study entomology.

I would recommend, further, that renewed effort be made to secure an appropriation by the State Legislature for the necessary expenses of a state entomologist. So long as the entomologist is an attached simply of the laboratory of the geological survey, and cannot devote himself entirely to that science which he is expected to prosecute, all his observations will be fragmentary, his studies will be incomplete, and his conclusions likely to be of less value, if not wholly erroneous. Long continued and uninterrupted observations, throughout a whole summer, or several summers, are necessary to warrant him in giving answers to many of the questions that are presented to him. Through the winter he must study his collections, collate his notes, mount his cabinet specimens and prepare his annual report.

Thanking you for the honor of having served the Society during the year past,

and hoping that you will relieve me by electing some other person for the year to come, and that you will find means to carry out successfully a thorough investigation of the insects of the State.

I am very truly yours,

N. H. WINCHELL.

The following paper was then read:

SOME NOTES ON THE BIOLOGICAL APHIDÆ, OR PLANT LICE.

By O. W. OESTLUND, Minneapolis.

Apparently the plant-lice are among the smallest and most insignificant of the insects injurious to man. In size so small that they are seldom noticed, although to be found on almost every plant if searched for, except when they occur in such great numbers, as they sometimes do, as to completely cover the limb or plant they infest. They lack the firmness of body of most other insects, as only a touch with the finger is usually enough to crush them. But that they in spite of this are capable of inflicting an injury that is often as great as that of other insects apparently more favored, the husbandman very often finds to be the case. What they lack in individual strength they make up by their great number.

Even a century or two ago, when entomology was still in its infancy, a good deal of attention was given to this family of insects on account of their very sudden and numberless increase at times. The family has, therefore, probably given rise to a many discussions and hypothesis as any other in the class of insects, but nevertheless our knowledge of it is very imperfect and too much still remains a puzzle. The life-history, as made out in these early days of entomology has continued to present time with very few changes, and is still found in much of our current literature, although several facts that have more recently been ascertained would call for one more correct. I shall first give you this life-history as usually found, quoting Dr. Thomas from the eighth annual report of the State Entomologist of Illinois, and will then give you in outline the history that I think we are justified to accept in light of what is at present known in regard to these insects. Dr. Thomas says: "In the autumn, as a general and almost universal rule, the last brood, consists of winged specimens, both males and females. These pair, soon after which the male dies; the female deposits her eggs, after which she also dies. Early in the spring, as soon as the sap begins to flow, these eggs hatch, and the young lice at once insert their tiny beaks into the bark or leaf on which they are situated, and begin to pump up the sap. They wander but little, their entire work being devoted to feeding; hence they grow rapidly and soon come to maturity.

"This spring brood consists, generally without an exception, of females without wings. These females, by some strange provision of nature, are capable of reproducing their kind without the intervention of the males, and, instead of depositing eggs, as the last fall brood, are usually viviparous, bringing forth living larvæ.

These are likewise all females, similar to those from which they spring, and they, in turn, produce a similar brood in the same anomalous manner. This process is repeated again and again during the summer and until in the fall, through some six or seven or even more generations. The last fall brood presents a remarkable

change, for it usually consists almost entirely of males and females which acquire wings. These winged females, as previously stated, after pairing, deposit eggs which remain over winter."

In justice to this writer, it is proper here to remark that he gives us this history as generally given and understood, wherefore he also calls our attention to the fact that more careful and recent observations have shown, in several respects to be incorrect.

One of the greatest objections to this life-history is that the winged females were supposed always to be oviparous. It is now known that they, as a rule, are viviparous, just as the wingless form that first comes in the spring; and that they are not only found in the fall, but more particularly during the summer. The oviparous females of the fall, on the other hand, are now known to be wingless. In pursuance of these and some other facts the life-history will read somewhat different.

SPRING BROOD.

As soon as the leaves begin to make their appearance in spring, the eggs hatch, and the young larvæ are soon ready to insert their beak and begin to pump the sap. This first brood can well be called the spring brood, though the word brood is here used in a more special sense than usual, as strictly the plant lice cannot be considered but one-brooded, and what we here call brood being simply a form; but as the expression is very often used in treating of the plant-lice I find no objection to it, and moreover, as it can not be well misunderstood when used in this connection. All the individuals of this brood are wingless females, which in a few days, being full grown, begin to reproduce their own kind by giving birth to living lice, similar to themselves, and these, in turn, are soon ready to add to the number of the colony. The number produced by each individual for the day varies, but under favorable circumstances there are several, hence the very sudden and great increase that we sometimes observe.

These wingless females show very little desire to wander about, and usually pass their whole life on the same plant. The dispersion of the species is therefore not the object of this brood; their whole life being devoted to the increase of the colony,

SUMMER BROOD

As soon as the warm days of summer have come we find that some of the young lice differ considerable from the parents, especially in the presence of wing-pads and in being more active. These young lice with wing-pads are called pupæ, which, after the last casting of the skin, come forth with full developed wings. In descriptive entomology they are designated as the winged viviparous females, and can also be considered as the second or summer brood. Soon after having acquired wings, these also begin to bring forth living lice in the same manner as the wingless or spring brood, and in this respect do not at all differ from the first brood. But as the colony has by this time so increased in numbers as to make it uncomfortably crowded for these individuals. These winged females soon begin to take to their wings in search for new plants where to establish new colonies. The office of these winged females, therefore, is not only to increase the colony in the same manner as the wingless form, but in addition hereto they have as there duty the dispersion of the species.

That this is the case is of easy observation, especially in regard to many of our garden species, and I need but call your attention to the cabbage or squash aphid, as all who have observed these species probably know that in spring they are found in comparatively few but in very large colonies, and that while one plant may be badly infested, the one next to it may all together be free from the pest, as this first brood seldom does wander from one plant to another. But if we examine the field after the second brood has come to its greatest development, we can usually find not only every plant has almost every leaf with a number of young colonies on them. These young colonies can easily be recognized in that they consist of a winged female with a smaller or greater number of wingless individuals close around her of all sizes and ages. The species inhabiting the squash is especially conspicuous in this respect, as the females usually choose the outer border of the leaf where to establish their colony, and therefore a series of colonies can often be seen encircling the leaf on the under side.

In nature the preservation of a species is always most admirably provided for.

So the plant-lice, that in the wingless form would be incapable to disperse the species successfully, as even a small stream of water would make an effectual barrier, we find that it is most perfectly performed in that some of the viviparous females, in height of the summer, as the most favorable time for flight, acquire wings in order to do this duty.

FALL BROOD.

In the fall quite a different brood makes its appearance, consisting of sexually developed males and females. As before stated, it has usually been considered that all the individuals of this last brood, or fall brood, were winged, it is now known that not only the females, as a rule, are wingless, but that the males are also sometimes wingless. I have observed the oviparous females as wingless in the following genera: Siphonophora, Myzus, Rhopalosiphum, Aphis, Chaitophorus, Lachnus, Callipterus, Mattopoda, Schizaneura and Pernphigus. The only case in which it is positively known that the oviparous females are winged is some of the smaller and lower genera. The largest genus aphid is still clothed in much mystery, the life history of but comparatively few species being well known. Yet all that is at present known goes to show that the oviparous females are wingless.

The occurrence of wingless males has been noticed in several cases, though it is still considered as an open question by some entomologists. We usually do find the males as winged, and the occurrence of wingless can only be considered as an exception, but an exception that is not as rare as generally supposed. In the genus Siphonophora I have observed this form as occurring in several species; usually only as a few individuals, the majority being winged. In one species, belonging to this same genus, all males observed were wingless, not a single winged specimen could be found. This species is found on the wormwood or "sage" (*Artemisia frigida*, Wild.) growing plentifully along the bluffs of the Mississippi in this vicinity, and as it is apparently new to science I have described it as such in the 14th annual report of the Geological and Natural History Survey of Minnesota, naming it *Siphonophora frigida*, as found on this northern variety of wormwood. As I have been able to follow nearly the whole life-history of this species I shall give it as being peculiar in respect to the wingless males, and at the same

time as a recapitulation of the life history of this family as just given. The spring brood consists exclusively of wingless viviparous females that go on increasing the number of the colony in the usual manner. The winged viviparous females of the summer brood were observed during July and August when the dispersion of the species was going on, after which they disappeared and only wingless individuals could again be found. In the fall I expected to find the winged males of the last brood, but after a most diligent search for them during September, October and partly also November, until the cold weather set in, I was unable to find a single specimen. Wingless males were repeatedly observed during this time, though few in number in comparison with the other form. These could easily be recognized as they are somewhat smaller and differ also considerably in color. After a careful study of this form I am convinced that they are normal males, and the only form found in this species. The wingless females of this last brood, after pairing, deposit the eggs on top of the branches ready for hatching as soon as spring again comes around.

HOW WINTER IS PASSED.

How the plant-lice do pass the winter is a question on which there still are different opinions. In regard to most of the species it is still a mystery, as it has been made out in but a comparatively few cases. All those species that are known to deposit their eggs on trees in the fall, there is no doubt of that they do pass the winter in this state. And I do believe that this will be the case with all as they become better known.

Doctor Thomas suggests that some very probably do pass the winter as a demorphised form on the roots of certain plants,—dimorphism being known to occur in several species of plant-lice—and that consequently many of those species inhabiting roots will be found to be but a demorphised form for passing the winter of some aerial species. As Doctor Thomas seems to be pretty well satisfied that this is the case with a large proportion of the pale, cream-colored subterraneous species, it deserves our consideration, but more extensive and thorough study of the subject will be necessary before the question can be set at rest.

The root-inhabiting species that have come under my observation in this locality are yet but few—only three species were found last summer, all of which are without any doubt distinct species as is also apparent from the fact that they are found not only in the fall, but during the height of the summer; and that they occur in different stages of development, as larvæ, pupæ and even acquiring wings while still under ground. The three species observed were: *Aphis middletonii*, Thos., found on the roots of the flea-bane; *Schizoneura panicola*, Thos., found on the roots of several species of grasses; and *Tychea ra dicola*, Oest., found on the roots of the great rag weed, (*Ambrosia trifida*, L.)

When the full life-history shall have been made out of these subterraneous species we can look for a most interesting and valuable page in regard to this family. With the exception of the well known demorphised form of the woolly aphis of the apple tree (*Schizoneura lanigera*, Hansen,) the corn plant louse (*Aphis maidis*, Fitch,) and the grape phylloxera, very little is known at present about this subject.

That inhabiting roots is not the original mode of life in this family, but has been acquired in time I think will be apparent to any one at all familiar with this

subject. Allow me to make a suggestion as to how this mode of life may possibly have been acquired in the family. Ants are known to be very fond of plant-lice on account of the sweet fluid or honey that they emit from the honey-tubes. They are also known to take very good care of them, to protect them from enemies as far as possible, and to remove them to a place of safety if they are much threatened, it is therefore probable that in time the ants also brought them down under ground into their own habitations for protection, and accidentally finding that they could here also have suitable food from the roots of the plants, the first step was taken towards the domestication of the plant-lice by the ants. These domesticated species would necessarily change considerably in time and are now found as distinct, probably making it a very difficult matter to trace them from their original stock. We cannot presume that whole species were transformed into a root inhabiting but a part must have continued as aerial. These subterranean plant-lice would therefore, not be a dimorphised form, but a dimorphised species, if we may use the expression, of some aerial species. But it is not my intention to enter more fully into this subject of dimorphism this evening, how interesting it yet might be. If I can only in some degree call your attention to this subject for future observation by showing that even in this much neglected and little attractive family of plant-lice, we yet have some of the most interesting problems of insect life, enough has been said.

During last fall I had the good fortune to find the eggs of several species that probably will be worthy of mention. Of the highest genus they were observed in three cases.

Siphonophora frigida, Thos.—Found on the ragweed (*Ambrosia trifida*, L.) As only a few eggs were found on any one plant, I am still in some doubt if they are usually deposited on the plant, or in some other place. On dissecting the oviparous form eggs were always found.

Siphonophora frigida, Oest.—This species, as noticed above, deposit the eggs on top of the branches of the plant they inhabit (*Artemisia frigida*, Wild.) When first laid they are soft and pale in color, but soon become hard and shining black on exposure to the air. By the hardening of the viscid substance that covers them at first, they become closely cemented to the plants, where they remain over winter.

Siphonophora adianti, Oest.—A species inhabiting one of the ferns (*Adiantum pedatum*, L.) was observed to deposit the eggs on the under side of the fronds, and as these remain attached to the root-stalk over winter, the young larvæ will have no trouble to find the new growth, which springs from the same root-stalk the following year.

Myzus potentillae, Oest.—A species that is closely related to the currant aphid, also deposit the eggs on the underside of the leaves of the plant on which they live, and as these, like the foregoing, remain over winter, their larvæ are as well provided for.

Aphis mali, Fitch.—The apple tree aphid is well known to deposit the eggs on the trunk and branches of the apple tree. All the trees observed from this locality are well stocked with eggs for next summer. The eggs were mostly deposited during the month of October, though some as late as November. They are of a dirty green color when first laid, but soon become shining black.

The extensive genus *Aphis* has so far given the greatest trouble in tracing the

life-history of the species, and therefore, besides the apple aphid, very little is known how they may pass the winter. If dimorphism will be shown to be one mode it will then mostly be confined in this genus. Most of the species inhabit annual plants, so the apple aphid can hardly be considered as a type for the genus in this respect, being one of the few that inhabit trees. It has even been questioned if the species can be taken as a type for the genus and not be put in some other. The nearest analogy that we have of species living on annual plants are *Siphonophora adianti* and *Mygus potentillae* noticed above.

Lachnus solicicola, Uhler.—This very common and largest of our species is found on several of the willows, and were observed to deposit the eggs very abundantly on the limbs; sometimes a limb being found almost covered by them.

Chaitophorus negundinis, Thos.—Living on the box-elder, deposited their eggs late in the fall in very great numbers on the twigs and limbs, usually choosing the underside of the limb as giving the best protection from the weather.

Chaitophorus spinosus, Oest.

Callipterus discolor, Monell.

These two species, inhabiting the oak, and especially plentiful on the campus of the University, were observed to deposit the eggs in the crevices of the bark. A peculiar fact, probably worthy of mention, is that these as well as all tree-inhabiting species, although they pass their whole life on the leaves, yet never will deposit their eggs on them but always do so only on the trunk or limbs; while on the other hand those that inhabit plants with leaves that remain over winter were found to deposit the eggs on the leaves; this being the case with *Siphonophora frigida*, *Siphonophora adianti* and *Mygus potentilla*. Why this should be so is obvious to every one, and we usually explain it by saying that it is instinct. Very probably it is instinct, but also a good deal of foresight connected with it.

From these, as well as what is known in a few other cases, I think that we have reason to consider the egg-stage as the mode for passing the winter for the family, though more extensive observations are necessary to confirm this.

There are, undoubtedly, still those who would consider it only a waste of time for an intelligent person to concern himself about how the plant-lice possibly may pass the winter, but I feel confident that I have not such before me this evening and wherefore I will not need to ask excuse for taking up some of your time on this subject. I do not present to you some of the results of my observations, only as a curious fact that may interest you for the moment; not only to show some of the great wonders of nature as found even in these so insignificant beings, not only as a small addition to science, that in no other way can be built up, but by such slow accumulation of fact upon fact, how insignificant they yet may be. There is also an economical side of the question that will deserve your attention as fruit growers of this State, as well as many others in a similar calling. It is very probable that the egg-stage will be the time, when we can best and most successfully destroy this insect—pest of the garden, field and orchard. Too little is as yet known to say much on the subject, but if all-attention be called to it, future observations and experiments are likely to give us some most valuable results.

In conclusion I shall give a short account of a few of those species especially that, concerns the horticulturalist, as found in the orchard, or on the ornamental trees

and shrubs. In the 14th annual report of the Geologist and Natural History Survey of Minnesota I give a list of all the species observed in this locality—some seventy and odd species—to which I refer those who may wish a more extended account.

The species that probably more than any other concerns the horticulturist is the apple-tree aphid (*Aphis mali*, Fitch.) It is found very common in Hennepin and Ramsey counties, and most likely is already found over the whole State wherever the apple is grown. A number of young trees lately set out on the experimental farm of the University were observed to be badly effected. In this case the trees very likely were infested by the aphid, or at least the eggs, before being set out, or they would hardly have occurred in such great numbers as they did, there being no orchard very near. It would therefore be well to have trees inspected before they are set out in a new place where the aphid is not likely to be found before, and if aphid or eggs be found, that they be well cleaned so as to make them exempt from this pest, at least for a year or two, until they can be well rooted and better able to withstand. A young tree on being transplanted has all it can do under ordinary circumstances to accommodate itself to the new locality without having in addition hereto myriads of aphid continually pumping the sap and destroying more or less of the leaves. After a tree has well come under growth it can withstand the presence of aphid as ordinarily found without very much injury, except when circumstances are more favorable for the aphid than the tree, as we some years find to be the case, when even a healthy and well grown tree will become much injured and even succumb.

Together with the apple trees, the mountain ash was also found to be badly affected by the same species of aphid. As far as I am aware, the apple tree aphid has never been recorded as affecting the mountain ash, although we might expect this to be the case from the close botanical relation of the two species.

The species inhabiting the cherry, (*Myzus cerasi*, L.), although not observed in this vicinity, is known to occur in the State. It is very similar to the apple aphid in habits, and often quite as injurious.

A closely related species is the one found on the currant, (*Myzus ribis* L.), observed to be rather common in this county, and to cause a good deal of injury by cupping the leaves, or forming hollows on the under side with corresponding chiefly swellings on the upper side. Leaves so affected turn yellow and fall off before the usual time.

Several of the more favored shade trees are more or less affected by species of aphid. This is particularly the case with the white elm that is affected by two rather common species. One of these, (*Schizonera american*, Reily), gnarling and curling the leaves, making them unsightly and of no use to the tree, and the other species, (*Glyphina compressa*, Koch), forming the cock's-comb galls so often seen on the leaves. Young trees, especially, are often found to be badly affected, and much injured by the combined efforts of the two species.

The boxelder, that is often met with in this county, and seems to be much favored as a shade-tree on account of its rapid growth and fine appearance is also often found badly affected by a leaf-inhabiting species (*Chaitophorus negundinis*, Thos.), and made unsightly by the filthy appearance of the foliage when badly affected. As before stated, the eggs of this species were observed very plentiful last fall, and

if next year should prove to be as favorable to plant-lice as the past we probably will find the species to be greatly on the increase.

The poplars of this locality are also affected by several gall-inhabiting species that not only do great injury to the trees, but also makes them unsightly as shade trees. This is especially the case with the vagabond gall louse (*Pemphigus vagabundus*, Walsh), found not only on the poplar but also on the cottonwood, as large, irregular cocks-comb galls on the ends of the twigs, greatly injuring and deforming the tree by stopping all growth of the twig thus affected. And as the galls remain over winter and turn black, they make the tree quite unsightly after the leaves have fallen. On University Avenue, we have a group of trees that are literally covered with these galls, hardly a twig being found that does not end with one.

Two other species are found to make their galls on the stalk of the leaves, but as these are smaller and fall with the leaves they are less objectionable.

The following paper by R. J. Mendenhall, of Minneapolis, was placed on file:

USEFUL INSECTS.

By R. J. MENDENHALL, Minneapolis.

Mr. President and Horticultural Friends:

In the talks that we have had from year to year on the subject of insects, I have called your attention only to the pernicious caterpillars, worms and grubs from which we, as gardeners and fruit-growers, suffer every year more or less loss. I think now, in justice to the "bug" community, that I ought to say a few words on the other side, and introduce to you, instead of enemies, a few of the more important of our six-legged friends.

When we come to count them up we find that the "good bugs," in point of numbers and value of services rendered, very nearly balance the "bad" ones, and that if the former were all to be suddenly exterminated we should find ourselves, in spite of our "insect powders," "emulsions" and "spraying machines," quite powerless to protect our fruits, flowers and vegetables against the destructive species. Those that I have called "good" are such from a human point of view only, and because they assist man—not by any means, however, from motives of benevolence toward him—in keeping in check the species that do him most damage. By their own kind, there is every reason to believe, they are regarded with terror and abhorrence, as the most ferocious and greedy of murderers and cannibals and very likely they are "out-lawed" by every first-class insect community.

The insects that have proven themselves useful to us in the manner indicated, may be divided into two classes, the predatory or hunting species and the true parasites. In the first class will be found the Tiger beetles, the various ground beetles, the Water-tigers, the larvæ of the Lady birds or Lady bugs, the various sorts of Soldier bugs and the larvæ of the lace wing flies and some few other Nerve-winged species. Most of the true parasites are found among the two-winged or four-winged flies.

The Tiger beetles and Ground beetles are the tigers, leopards, lions and cats of

the insect world. They are as beautiful and as ferocious, in their small way, as are the warm-blooded felines of the African and Asiatic jungles after which they are named.

The Tiger beetles are of medium size, varying in length from one-half to three-fourths of an inch; the form is slender and graceful with the head set on vertically, and the colors are various shades of metallic green or purple, marked and dotted with pale yellow or white. The legs are long and the insects run with surprising rapidity. When pursued they make a series of short, swift flights alighting about every rod. The larvæ are most repulsive looking grubs, having an enormous head and jagged jaws, and the body being furnished with long, sprawling legs and several hooks and horns, by which they sustain themselves in their perpendicular burrows. They live in tunnels from ten to twelve inches deep and about as large around as a common lead pencil and generally bored in hard ground. At the mouth of its tunnel the larva lies in wait for any unsuspecting insect that may happen along, which it seizes in a twinkling and drags to its under-ground den and devours.

The ground beetles (*Carabidæ*) are one of the largest families of the *Coleoptera* and are of many sizes, shapes and colors. Some of the larger species are very beautiful. They are regular hunters, running swiftly over the ground with the head slightly bent, the antennæ projected forward and the sharp jaws apart, and very few insects which they scent escape them. The larvæ are horny, flattened grubs which are as active in burrowing in all directions underground in search of soft bodied grubs and caterpillars, as the perfect insects are in pursuit of their prey on the surface. A very useful species is the Rummaging ground-beetle (*Calosoma Scutator*). This handsome fellow is over an inch long with wing covers of a bright metallic green color, and the head and other parts of the body purple and blue or green with golden reflections. It kills great numbers of the larvæ of the Colorado potato-beetle, the Codling moth and the Curculio before they transform, and its larvæ is just as greedy in devouring the species that have entered the ground.

Another species equally valuable and almost as attractive is the Fiery ground-beetle (*Calosoma calidum*.) This is somewhat smaller than *scutator*, of a black color thickly dotted with large, bright, coppery spots arranged in rows on the wing covers.

A third species, the Elongate ground-beetle (*Pasimachus elongatus*), is of a smooth shining, jet black color, bordered all around with deep blue. This beetle has a very broad head and conspicuous jaws and other mouth parts. The only other member of this group which I shall mention here is the murky ground-beetle (*Harpalus caliginosus*.) This has not so much beauty to commend it to our notice, being entirely of a plain, dull black color, but it has proved itself of service in the exterminating of various leaf-feeders that prey upon our crops.

Everybody knows the trim little Lady birds (*Coccinellidæ*) with their red or orange black-spotted coats. They are of round or oval form, and rather small size, the largest not more than one-third of an inch long. The perfect beetles are sometimes found on flowers, but more frequently on leaves and stems infested with plant-lice or bark-lice which they themselves do not feed upon, but among which they deposit their eggs, and the awkward, ugly larvæ which hatch therefrom very soon dispatch a whole colony of the tender *Aphides* or young *Coccidæ*. There are a great number of species, some of which are very small, only one of which feeds in its larvæ state on vegetation, and that is quite rare.

The Soldier bugs, which we are to consider as friends, are medium sized, shield-shaped, vile-smelling insects, differing from beetles in having the wing covers apparently crossed on the back, with the tips membranous, and instead of jaws they are provided with a strong jointed beak, which they thrust into any soft bodied insect that they come across and suck out its life blood, leaving it when their appetite is satisfied, shrunken and limp, never to recover. *Arma spinosa*, a rather small, dull, green species is one of the principal foes of the Colorado potato beetle, and of some other very injurious grubs and worms. Most of these bugs are dressed in very plain colors, but a few wear bright red or yellow military stripes. These are among the most active and do not need to approach their victims "on the sly."

The Lace wing flies and ant lions are among the few Neuropterous species that do not breed in the water. The perfect flies take but little food, but the larvæ are very voracious. The habits of some forms are very interesting and well repay the observer for the time spent in watching them. Among these is the Ant-lion, an insect resembling a small Dragon-fly but with a slender and rather short body and disproportionately large, floppy wings, which are beautifully spotted but which is does not seem to have sufficient muscular force to manage skillfully. The larvæ are jug-shaped with a horny head and long, sickle-shaped jaws. They are usually found in sandy situations in which with their jaws and strong front legs they scoop out a funnel-formed hollow, hiding themselves at the bottom. If an insect accidentally runs into the open mouth of the funnel it is instantly bewildered and brought down by a shower of sand thrown upon it by the waiting cannibal below, which speedily devours it or such parts of it as may suit its taste. It then arranges its trap for another victim.

The Lace wing flies are beautiful and symmetrical insects with four gauzy iridescent wings and golden and green bodies. The eggs of the genus *Chrysopa* are attached to the top of long thread like stalks in the midst, or very near a colony of plant-lice. The larvæ are slenderly oval in form, with strong, thoracic legs and and scissor-like jaws. They are very voracious and destroy incredible numbers of the lice. When full grown they enclose themselves in a dense, white, round or oval cocoon prepared with a lid at one end which is pushed open by the fly in emerging. The larvæ of the genus *Heemerobius* cover their bodies with the skins of their victims.

The plant-lice have still another deadly enemy in the larvæ of various *Syrphus* flies. These are large, flattened, slimy maggots, very disgusting in appearance, but very efficient in clearing the plants on which they are found of the little, vivaporous sap suckers. The flies are usually somewhat longer than the common house-fly; with more slender bodies which are in many species banded with bright colors.

These are all the cannibalistic or predatory insects that I have time to mention at present.

The genuine parasites breed in the bodies of caterpillars and grubs and prevent their development. I have had occasion to call your attention to some of these before, in connection with various leaf-feeding and fruit-feeding pests.

The *Tachina* flies are among the most important of the two-winged parasites. These closely resemble the house-fly in appearance and structure, but are usually larger and have more hairy bodies. They go through their transformations within the body of the host insect, as a rule, but sometimes leave it to enter the ground.

The pupa case consists of the shrunken and hardened skin of the mature larvæ, and the fly issues by a sort of trap door at the upper end. The four winged parasites include a great number of very diverse forms, all bearing more or less resemblance to bees and wasps which are among their near relations. The females are furnished with bristles or horny organs at the tip of the abdomen which are of a great variety of shapes and lengths. These are the oviparitors, by means of which they can place their eggs in the bodies of caterpillars, worms and boring grubs which they cannot closely approach. Some of these flies like the larger *Ichneumonidae*, are so large that a great caterpillar such as the *Polyphemus* or *Cecropia*, or some of the grape vine or tomato vine Sphinxes, are only sufficient for food for a single larvæ. Others are so small that a hundred or more will be nourished on the fatty parts of a single worm. Some have oviparitors four or five inches long by which they are able to find the borers in trees and place in their bodies an egg from which hatches a sort of insect cancer for which there is no cure. By some strange instinct these parasitic larvæ avoid the vital parts of their victim which feeds languidly and lives along until its tormenting guests have completed their growth and are ready for transformation.

We have all seen large sphinx worms on the grape or tomato or tobacco whose bodies were covered with tiny white cocoons, like grains of rice set on end, which were still alive though punctured in a hundred places where the little parasites had cut their way out. It is unfortunate that the "first law of nature" enables us to look with satisfaction on such barbaric and pitiless processes, but if insects did not prey upon each other in the ways I have mentioned man would never be able to hold his own against them. The multiplication of the vegetable feeding species is so rapid and excessive on all our most important plants that were it not for the assistance we receive from the small, but not insignificant allies, whose vigilance far surpasses our own, they would soon take complete possession of our fields and orchards and leave us penniless and disheartened.

It is most desirable that all should learn to distinguish the beneficial from the injurious species, that the former may be exempted from the death sentence which we are very apt to execute without any form of trial, and in so doing often destroy a friend instead of a foe. This is a branch of economic entomology that should receive especial attention at our agricultural colleges and at all meetings that have for their object the promotion of practical agricultural science.

BLACKBERRY CULTURE.

On motion of Mr. Cutler, Mr. C. H. Hamilton was requested to give the Society some of the results of his experience in blackberry culture.

Mr. Hamilton. Mr. President, I did not come here with any intentions of making a speech, and I hardly know now where to begin on this blackberry question. I will state to you, in the first place, that we are quite extensively engaged in cultivating blackberries; also other small fruits, but we are making a speciality of blackberries.

I think it was about eight years ago there was some three acres

planted at our place. Those of us that were beginning in the business were cautioned by some of the older ones to move cautiously, that it wouldn't be but a year or two before the blackberry business would be overdone. Well, we have progressed along, as fast as we could get the plants, and at the present time there are about seventy-five acres planted inside the city limits of Ripon; we claim that we have had success, and it has been obtained by means of thorough cultivation, care and protection.

Some people ask me if the variety known as the Ancient Briton is hardy and will endure our winters. I tell them it will, and that it is as hardy as any known variety, to my knowledge. Again, they say, "The idea of laying them down is a great expense, so much so that it takes off all the profit." That is a greater bugbear in the eye than it is when you come to go to work at it and try it. The expense of laying down an acre of blackberries I am not at present prepared to give, but I can take a five acre patch, and give you some idea of the expense connected with its cultivation. In removing the old brush, laying the plants down, and covering for winter, the expense on five acres was thirty-six dollars; the further care of them, raising them up in the spring, and preparing them for fruiting, the expense would be about twenty more, making about fifty dollars to insure a crop on five acres for the next year. In the last seventeen years that I have known this variety to be cultivated in that way, I haven't known it to fail. I claim that an outlay of fifty dollars on five acres of ground insures me a crop of one thousand dollars worth of fruit. This can be substantiated by my salesbook.

The fruit of this variety is one of the best for shipping I have ever seen; it is a large, firm fruit. Mr. Tuttle has extended an invitation to send two or three men over to our place to look at our mode of cultivating and our different patches of berries, and we shall be glad to meet any persons that you may see fit to send there, and we guarantee that we will show them as fine fields of blackberries as they can find anywhere.

A Member. What distance apart do you set the canes?

Mr. Hamilton. We plant in rows, seven feet apart, three feet in the row; occasionally some eight feet by three feet; some plant eight feet by four feet. A trellis is placed on each side, and the wires and stakes are about twenty feet apart.

A Member. What is your mode of cultivating?

Mr. Hamilton. It is to keep the ground as rich as we possibly can.

We mulch for winter, drawing the mulch out in the summer and working it into the soil for the purpose of keeping the ground rich. We cultivate about in the same manner as you would a piece of corn; giving thorough cultivation, but not deep.

A Member. What is the character of the soil?

Mr. Hamilton. We have a variety of soil at Ripon. We can furnish a black loam, prairie soil, underlaid with clay subsoil; then we have a sandy clay soil and loam; we also have almost clear sand. They are a little earlier on the sandy soil than on the prairie, but as to the difference, whether they do better in one place than in the other, you can't tell it by the eye.

A Member. Do you prune any?

Mr. Hamilton. Yes, sir, we pinch them back to about three feet and three and a half feet high. That causes them to branch out. Some of them undertook to trim the laterals, but we found that we were cutting off the part where our best fruit grew. We now take off nothing but the top.

A Member. Is the Ancient Briton as hardy as the Stone's Hardy?

Mr. Hamilton. I consider it is fully as hardy.

A Member. Are they thorny?

Mr. Hamilton. They are a thorny bush.

A Member. How many canes do you allow in a hill?

Mr. Hamilton. Not over five; you will not very often find that many.

Mr. Smith. How do you cover them?

Mr. Hamilton. They are covered by removing the dirt at the side that you wish to lay the brush over. Then place your foot at the crown of the fork and push it under the root and bend down; you bend the root by so doing, and not the top. Lay them down straight, as the row extends; we endeavor to cover them from the side. I think it is better to have the rows run north and south, because after they have been laid down, the dirt being again removed, the canes will run in the angle on which they were laid down; the new growth will be in full foliage and that breaks the heat from the midday sun on the berries. You have all observed that the best wild blackberries we get are those that have been raised in the shade.

Mr. Cutler. I would like to ask whether you turn them north or south?

Mr. Hamilton. We bend them to the north; that is the way they run. We endeavor to have the rows run the way that they would

be most likely to carry off the water. If it is on a sidehill and the slope is to the south, we should have the rows run north and south, so that when the plants are covered it will make a ridge, and the water which is apt to collect between the rows will flow through them. Water is detrimental to the plants. We cover with dirt.

Mr. Pearce. Do you cover the vine entirely up?

Mr. Hamilton. Yes, sir.

Mr. Pearce. Is it necessary to do it?

Mr. Hamilton. In our locality, some claim it is not; but when we have no snow, I do not consider it safe not to fully cover. It is not the cold weather that kills the cane so much as the freezing and thawing, and we think we have too good a thing to run any risk, when it only costs from six to eight dollars an acre to insure their coming through the winter in excellent condition.

Mr. Pearce. Did you ever try putting only sufficient dirt on the canes to hold them down?

Mr. Hamilton. Only along the side of fences where snow gathered in. It isn't safe to leave them uncovered except where snow is likely to collect.

A Member. You said you mulched, what time?

Mr. Hamilton. We draw it in the winter, and leave it in heaps there; after we have raised our plants and hoed them out, we put this straw or mulch around them and then do our cultivating afterwards.

A Member. What slope do you consider the best adapted for blackberries?

Mr. Hamilton. I consider a south slope the best. I should prefer a level piece, but not what you might call a low piece.

Mr. Underwood. Will you allow me to add a word in connection with what you said of covering. A gentleman from Dakota who is growing some berries, was at my place this fall and telling me how he covered his vines, and I practiced it a little. He has a man go along with mittens on, who straddles the row and lays the plants down while another man follows and puts on some earth to hold the canes down; when he has that done, he hitches a horse to a plow and throws up a furrow, covering the canes. He covered some grape vines in the same way.

Mr. Hamilton. That it is an easy and quick way of doing it, and you will get through the first winter, likely, all right, but it is hard governing the plow, and you will break and loosen a quantity of roots; then it is necessary to keep one man in there the rest of the season to

keep the sprouts down, while you will find that you have broken the roots from the main vines and checked them. I undertook to cultivate them in that way, but I soon found it was really costing me more, and I took to laying them down with a spade, wholly.

Mr. Underwood. You take the dirt out on the north side so as to lay them down toward the north?

Mr. Hamilton. Yes, sir; my rows run north and south, and I take out the dirt on the north side so as to lay them down toward the north.

Mr. Underwood. I think that is a very important item; if it isn't going to do to plow with a horse and cover them in that way, we ought to know it.

A Member. How high will they grow?

Mr. Hamilton. They will grow from eight to twelve feet high; but we endeavor to keep them back to three and a half or four feet; we keep them in hills and keep down all sprouts.

A Member. What price do you get, wholesale, for the berries?

Mr. Hamilton. My berries this year were sold at \$1.60 a case.

Mr. Smith. Ten cents a box; about two thousand cases for the five acres.

A Member. I understand you cultivate with the hoe?

Mr. Hamilton. Between the rows we do all the cultivating with a horse; we do not cultivate very deep, using a common corn cultivator.

A Member. Do you give them any support, after planting?

Mr. Hamilton. Not the first season; but the second year we support the canes with wires on each side. If there is nothing to protect them from the wind, it will soon break them over, and they will be sprawling all over the ground.

A Member. How high is that wire?

Mr. Hamilton. About two feet and a half. We put one wire on each side, and the stakes are about twenty feet apart.

Mr. Smith. In regard to mulching, did you state the material that you used?

Mr. Hamilton. I have mulched with almost every variety of straw and hay—anything that I could get.

A Member. How much mulch do you use?

Mr. Hamilton. You can't use very much if you cultivate. There is no need of cultivating from six to eight inches on each side of the row. Hardly any plants or weeds will grow under there, on account of the shade.

A Member. Do you fasten your vines by those wires in any way?

Mr. Hamilton. Well, occasionally we cross-tie them.

A Member. Please tell us what you know of the history of the Ancient Briton.

Mr. Hamilton. As far as I have been able to trace the history of it, it was originally sent from Wales, to a county in Southern Wisconsin about twenty-two years ago. A man in Berlin, Wis., first got hold of a few plants and set them out, and he came through Ripon, the first I heard of him, seventeen years ago this coming spring. I bought a few plants of him, and also a few of my neighbors. I was not in the fruit business then, I was running a general nursery. My neighbors planted them out; they did not protect them and they said they didn't think it was of any use to try to raise blackberries there. One fall I was unloading a hay-rack, and a row of blackberries were near, and as they hadn't borne, we expected to dig them up in the spring, and the men put this hay-rack on them; they were thus laid down under the hay-rack. The next spring these canes were alive and the rest of the row killed. That suggested to me the idea of covering and the question why not lay down the blackberry as well as the raspberry? I undertook the task of laying them down. And that was followed up by different persons in the vicinity of Ripon, until now, blackberry culture is one of the chief industries of our town. There are about seventy acres, as I said, in cultivation in that vicinity now.

A Member. How far from the ground do you place those wires?

Mr. Hamilton. About two feet. I had five acres of blackberries last year; I took 725 bushels off the five acres; on one acre it was the seventh crop.

A Member. Will they run out in the course of ten or twelve years?

Mr. Hamilton. There are plants in Ripon that have borne the fifteenth crop, and are still in good condition; I have seen them eighteen years old.

A Member. They stand it better than red raspberries then?

Mr. Hamilton. Yes, sir.

A Member. Does any insect trouble your blackberries?

Mr. Hamilton. I have never seen anything on the Ancient Briton; I have noticed that the Stone's Hardy was affected in some cases.

A Member. Don't you consider the Stone's Hardy a better berry than the Ancient Briton?

Mr. Hamilton. No, sir. I claim I can send the Briton blackberry to Minneapolis in better order than you can the Stone's Hardy, half a mile distant from your market.

A Member. Doesn't your Stone's Hardy continue longer in bearing than the Ancient Briton?

Mr. Hamilton. No, sir, I think not.

The following paper was placed on file for publication :

A COMPLETE FARMER'S GARDEN,

By JOHN S. HARRIS, La Crescent.

Mr. President and Members of the Minnesota State Horticultural Society:—

Our motto is good fruits of all varieties in abundance for all purposes; an abundance of fresh vegetables upon our tables every day in the year; lovely flowers to shed their fragrance over the pathway of life.

While I acknowledge that I am by nature a farmer and in experience and education a life long gardener, I am convinced that some one has made a mistake in designating me to present to this meeting a paper upon the subject of a Complete Farmer's Garden. I consider it in many respects the most important subject that will engage the attention of our Society, and worthy of being presented by some one more able than myself to make it interesting. It would be a simple matter to tell you what kind of gardens very many of our Minnesota farmers have, but a laborious and tedious task to map out and describe in detail such a garden as every farmer ought to possess who has cast his lot in this so-called "Farmer's Paradise," famous the world over as the beautiful land of "Golden Sheaves" and "Laughing Waters." When we look about us and consider the short period of time that has elapsed since our State was the hunting ground of the savage and the almost boundless pasture of the bison, where the tread of civilization had never encroached, and the hum of business had never been heard, we are led to exclaim, "wonderful marvel of the age." Within half a lifetime it has become dotted with towns and villages, and threaded with railroads and a trail of gold is following back upon each track and being switched off at every station, a tribute from the older "East" and "South" to the excellence of our "No. 1 hard," "sleek Shorthorns," and the prize "butter and cheese" of America. We have scores of farmers who take commendable pride in breeding good blooded horses, and without being jockeys they are compelled to take the dust from the best of any other state. We have hundreds of stockmen engaged in rearing the best cattle, sheep and swine that has ever found its way into any market. We have everything produced within our borders that is needed to get up the grandest exposition and fair, the eye of man ever beheld, and do not fear to come into competition with the world. What more do our farmers need, what greater boon can they ask? I reply, thousands of them need better homes, not merely a place to shelter their families, but true homes. The farm is the plant that creates or furnishes the life, wealth and power of the world, and the farmer is the commissary who opens up the storehouses of the soil, and gives out the bread to feed the teeming millions of the earth; therefore he is entitled to a home worthy the name. Now, my idea of a true farmer's home is as many broad, fertile acres as can be well tilled without making his life a burden and the life of his wife and children a hateful drudgery; good substantial buildings,

outwardly neat, and corresponding to the demands of the family, and located upon the pleasanter spot on the farm. Within, they should be convenient and supplied with the arrangements for lightening the labor of the housekeeper, and should contain ample comfort for the physical man, and for the inner man, pleasant pictures hanging upon the wall, good books and papers upon the table as a provision for mental improvement, and as a change, music is refreshing to the tired body after the rough and heavy work of the day is ended. There should be kept upon the farm the best of stock and that well cared for. The field fences and out buildings should present nothing unattractive about them but should harmonize with the dwelling. Upon the "ideal farm" there is no place for unsightly hedge rows of brambles and thistles along the fences or wood piles, worn out tools, broken down sleds and wagons and other rubbish in the street. Stumps and boulders have been removed from the highway, and rows of trees adorn its sides and in summer cast their refreshing shade upon the traveler, and in winter loosen the icy grip of the fierce blizzards. The dwelling stands well back from the road and in front is the well kept lawn, with here and there an evergreen or ornamental tree to break the monotony, and the walks from the road to the house are bordered with flowers, a reminder to the passing traveler that hospitality, comfort and happiness have a dwelling place within. The ideal home is a pattern after nature. Nature delights in beauty; she loves to brighten the landscape and make it agreeable to the eye. She hangs the Ivy round the ruin, and over the stump of the withered tree twines the graceful vine, and clothes even the Alpine heights with moss and lichens.

The farmer's occupation brings him into constant association with nature, and it is his privilege to draw inspiration from her handiwork.

Is that all that is necessary to make the farmer's home complete? Where is the orchard and the garden? What kind of a home is that which is barren of fruits, vegetables and flowers? Mr. President, do you think there are any such in Minnesota? How many farmers do any of you gentlemen know that furnish their tables with two or three quarts of fresh fruit every day from the time the first strawberries are ripe until the last cluster of grapes is clipped from the vine, and canned fruits for every remaining day of the year? How many farmer's gardens do you know of that are ample in size and furnish his family with all the fresh vegetables they can consume from the first sallads in spring until the cellar is stored for winter? What an improvement it would be, and what enjoyment it would give to take an acre or two out of that field that runs right up to the door, and transform it into a productive fruit and vegetable garden, and make it the most pleasant and profitable acre upon the farm. Even farmers want something more than to merely exist. Any good fruit and vegetable garden is worth more to the family than the products of any ten acres in wheat. Pork and beans, potatoes and bread, although they will sustain life, leave a void that can only be satisfied with the luxurious and wholesome products of the garden. In my opinion the farmer who does not plant a good plat of ground to small fruits and vegetables is not enjoying the advantages that God designed he should, neither is he dealing rightously by those committed to his charge. Why does he not do it? He says because he has no time to fool with such little things. Little things they may seem now, but when the end cometh, when his overworked wife has laid down the burden of life and rests in yonder cemetery, and his children have flown the parental

roof to find more congenial homes, and he finds himself a prematurely old man in the world, a sad picture to contemplate, he may look back upon the neglected little things with deep regret.

The complete farmer's garden should conform in style and character to the homestead and its surroundings, and in size to the wants of the family. It should be located in the immediate vicinity of the house, so that it may be readily accessible and under the constant supervision of the household. It should be located if possible, so as not to take away from the cheerful aspect of the homestead, but rather to add to its charms. If a portion of it is devoted to the cultivation of flowers, that should, if possible, be so located that the passing neighbor and stranger may enjoy its beauty and fragrance. Flowers are like pure breezes and sunlight, we enjoy them none the less because others enjoy them too. Another reason why it should be located near the house is that a great many leisure moments may be utilized in weeding and taking care of it, besides the saving of time in going a long distance to gather its products as they are wanted for daily use.

Some judgment should be exercised in choosing the soil for the garden. A decidedly gravely or sandy soil is unsuitable for general garden purposes, and so is a heavy tenacious clay soil. The very best soil is a sandy, deep, rich loam that will work easily and dry off quickly after a rain, and yet retain sufficient moisture to withstand considerable of a drouth. For this northern climate it is better for having a southern exposure sloping a little to the east and south. Almost all vegetables and most of the fruits do better upon land that is sloping enough to give good surface drainage, say about one foot to thirty. It should be securely enclosed so that neither stock, poultry or dogs can enter it at will. It would be better if the north and west sides were protected from chilling and tempestuous winds, either by a tight board fence or a live hedge. A high bluff, grove of timber or orchard on the north side affords good protection, but as farm buildings are often erected without regard to the garden it cannot always be located on the most suitable spot. Another important requisite for the garden, is to bring it into a high state of cultivation and fertility by deep plowing and the liberal application of manures. For the present purpose, as but few of our farmers will care to make a separate plot for each, we will make it a combination fruit and vegetable garden. Having selected, manured and fenced a spot for a garden, the next question that arises is, what shall we plant and how shall we manage to gain the best results at the least possible expense of time and labor. If it contained one or more acres of ground, I would recommend devoting one-third to one-half to permanent plantations of summer fruits, chiefly strawberries, raspberries, currants and grapes, and an asparagus bed, pieplant patch, etc. To facilitate cultivation I should plant every thing that will do as well in long rows instead of square plats, so that a horse may be used to help in the work. I should lay off a border upon the north side and the two ends, or all around, from twelve to sixteen or more feet wide, to be used chiefly for the permanent plantations of fruits and perennial plants, leaving a four foot walk inside to separate it from the remainder, and for convenience in using a wheelbarrow, turning the horse in cultivation, etc. In making the permanent plantation, commence on the north border, at the end nearest the house.

First, leave room for hot beds and cold-frames; next a little plat for early lettuce,

radishes and pot herbs, then let enough roots of rhubarb or pieplant to furnish material for sauce and pies before the early fruits are ready. The remainder of the north border may be set to grape vines, three or four feet from the fence and six to eight feet apart, and if a wide border and two rows are planted have the rows ten or twelve feet apart. If this space holds more grapes than is desired, a portion of it may be used for an asparagus bed or strawberries. The east and west border had best be used for strawberries, currants, etc. Upon the south border set two or more rows of raspberries, set the first row three or four feet from the fence, the second six or seven feet from that. Commence at one end and set both rows with blackcaps, as many as are desired three or four feet apart in the row, then set the remainder of the patch with red varieties three feet apart and keep them in hills, or if it is thought desirable to try a few blackberries, and I think it is, let them have thirty or forty feet at one end of the border. The reason for this is that a row of blackberries along side of the others would prove troublesome on account of their thorny habit and propensity to spread and run out everything else. If this border takes more of the above varieties of fruit than is desired, a portion of it may be planted to currants. Upon one of the end borders set as many currant bushes as will produce what fruit the family will require; they should stand four feet apart in the rows, rows six or seven feet apart. Of the remainder make an asparagus bed, or if other provision has been made for asparagus and currants, turn it into a strawberry bed. The other end border has been designed for strawberries, but if it is not needed for that use it may be used for a flower garden. Upon the border devoted to strawberries, set one-half this spring and plant the remainder to potatoes or some other hoed crop and the next spring set to strawberries. If it should be desirable to take two crops of berries from the same plantation before turning them under make provision for a third plantation to be set the third spring. This disposes of the borders and provides a quantity of fruit, shrubbery and vines that if properly managed will produce all the summer fruit that a large family can consume in the fresh state, and afford a supply for canning, drying and preserving for winter use.

A bed of asparagus unless it has already been provided for will finish the permanent plantation. It may be a single row upon either side of the garden, and four or six feet from any row already planted or in a plat of any shape, but the rows had better run in the same direction with our rows of vegetables to facilitate cultivation and avoid tramping or turning a horse when plowing or cultivating. This plant delights in a rich, warm soil, and pays well for good cultivation and liberal manuring. Once established it will annually throw up its abundance of rich, healthful food, through all our and our children's lifetime. The remainder of our garden plat is designed for the growing of culinary vegetables, and may be arranged to suit the different plantings, and planted in varieties and quantities to suit the wants of the family. The fitting of the ground can be mostly done with the farm team, plow and harrow, and the plowing may be done in strips just as wanted for planting, but I consider it the best to all be plowed as early as the soil is free from frost and in good condition to work well. If weeds should get started on any portion of it before needed for the later plantings, they can be pretty thoroughly destroyed by an extra harrowing, or it may be plowed again.

To insure the best results each species or variety of vegetable seeds should be

planted in their appropriate season. Peas, onions, beets, radishes and lettuce are rarely injured by spring frosts, and for the earliest crop should be planted as soon as the ground is in condition to work well. Onions for the main crop will also do better if sowed early, and a few early potatoes should be planted at the same time, but we expect the farmer to raise his main crop of potatoes in some other field. It is useless to plant the seeds of beans, sweet corn, cucumbers, melons, tomatoes, etc., in the open ground before the first week in May, or until the ground becomes somewhat warm and dry. A great many kinds of vegetables may be brought to maturity earlier if started in hot beds or cold frames, and transplanted into the open ground afterward.

The time allotted me will not admit a description of the making and management of hot beds and cold frames. Beets, carrots, parsnips and salsify or vegetable oyster usually do the best to be got in early in May. All root crops are the best in rows sixteen to twenty-four inches apart. Everything that comes up too thickly must be thinned to give the plants room for perfect development. It is better to have all vegetables in rows too close to admit of the use of a horse in their cultivation planted upon one side of the garden, and it is not essential that the rows of these should run the whole length, but they may be divided off into plots with narrow walks between each variety; neither is it essential that the rows of anything run the entire length of the garden if they are planted to such varieties as will admit of cultivating at the same time, and require the same distance between the rows. Cabbage and cauliflower may usually be transplanted for the early crop as soon as the plants can be gotten ready. It is useless to transplant tomatoes, egg plant and peppers before the latter part of May. Celery is not usually planted before the first of July. Of lettuce, radishes, snap beans and sweet corn it is best to make several plantings at intervals of two or three weeks, to keep up a succession until frost comes.

A garden line should be used in planting everything, and great pains taken that rows may be equally distant apart and perfectly straight. It might not produce a better quality or greater quantity of vegetables for taking these pains, but if our newly planted garden looks well, we will feel a greater interest in it than we would in a slouchily arranged truck patch, and as one thing after another begins to come up in clean straight rows, we will begin to feel proud of our accomplishment, and the whole family, even to the 'hired man, will become interested and willing to lend us a helping hand to keep it a thing of beauty. They will probably call it "our garden," and try very hard to make it the best one in the neighborhood, and perhaps it will stimulate our neighbors who see it to go and do likewise. This paper is very far from complete, but owing to its great length I must bring it to a close. To secure a better knowledge of the varieties of fruits and vegetables and methods of cultivation, I can only recommend my hearers to join the State Horticultural Society, and become active members. The complete "farmer's garden" is a "comfort and joy" to its owner. It is a prize that is not beyond the reach of every farmer in the State. It cannot be brought about at once. It may require years to do it. By doing a little at a time, adding one improvement after another, every farmer may create around him scenes whose beauty alone would amply reward him for all his labor. A garden thus formed by degrees is much more satisfactory than one produced at once by a great outlay of labor and money, because the pleasure of

creating was prolonged. In this way too, new fruits, flowers and vegetables may be added from time to time, each giving new pleasure and new beauty. The farmer needs recreation, and where can he find it better than in his garden? Time spent there will make him fonder of home and keep him from temptation, and as the love of home increases, he will surround it with associations of beauty, and memories of joy and pleasure will go with his children where'er they roam. And when his "last debt is paid," and his neighbors stand around his new made grave, they can truly say: "His work is done; he did it well, and there is one little spot of earth that is better for his having lived upon it."

On motion the meeting then adjourned until Friday morning.

MORNING SESSION.

FOURTH DAY, FRIDAY, JANUARY 22, 1886.

The meeting was called to order at 9 o'clock, Friday morning, by President Smith.

REPORTS FROM EXPERIMENTAL STATIONS.

It was announced that the first thing in order would be the reports from Experimental Stations.

The resolutions offered by Col. J. H. Stevens, on Wednesday, relative to a Committee on Seedlings, etc., were, on motion, unanimously adopted. (See page 174.)

Prof. E. D. Porter and P. M. Gideon not being present, M. Pearce, of Minneapolis, was first called upon for a report.

REPORT OF MR. PEARCE.

Mr. Pearce. Mr. President, I was not aware that I was down for a report, but I can report verbally as to what I am doing. A great many cions have been sent to me and I have grafted them and given them a trial. They were pretty much all root grafts, and came from different places, some from New York state and some from other distant points. Think there were fully fifty different varieties received, and all have been put out, staked and properly marked. A great many of the grafts came through last winter without any injury particularly, but some of them will die. I think some of them will be valuable; especially one or two kinds received from northern Nebraska. They don't appear to be injured at all.

A number who were expected to report at this time, not being present, N. J. Stubbs, of Long Lake, of the General Fruit Committee, was called upon for a report.

REPORT OF MR. STUBBS.

Mr. Stubbs. Mr. President, I have a few remarks written out here but the subject has been so thoroughly canvassed heretofore that it will, in a great measure, be a repetition of what has already been stated.

President Smith. It may be similar to reports from other districts, but that is to be expected.

Mr. Stubbs then came forward and presented a written report. This was a well arranged and somewhat lengthy paper, containing many valuable suggestions. It was, however, accidentally misplaced by Mr. Stubbs, and at his request is omitted here.

During the reading of the paper some discussion was had. Mr. Stubbs stated in reference to grapes, that his Delawares did not ripen well two years ago owing to the cold and backward summer season. He said he had experimented with a variety of currants that were supposed to be Stewart's Seedlings.

Mr. Pearce inquired if they were not the same as the Victoria.

Mr. Stubbs replied that he thought not, as he was well acquainted with Mr. Stewart, and thought he would not send out varieties not true to name.

President Smith. I have them growing on my place and think well of them.

Col. Stevens. It is not to be presumed that Mr. Stewart would put anything on the market that was not genuine, and claim that it was the same as the variety that he had been experimenting with for years, for he had a reputation for honesty and fair-dealing.

Mr. Pearce. I have heard many speak of this variety who pronounce it the Victoria.

Col. Stevens. I don't suppose there are half a dozen persons in the State that have it.

Mr. Elliot. There have been very few of them distributed.

Mr. Smith. There is a marked difference in the appearance of the bushes, more perhaps than in that of the fruit.

Mr. Stubbs stated that he had planted Fay's Prolific, but it had not yet fruited. They seemed to be very promising but he did not expect them to prove as valuable as they were recommended. He believed the Em-

pire State variety of grapes, for this locality, ahead of almost anything else, on account of earliness. It has not been known to be attacked by disease, even when planted by other varieties that were diseased; in this respect it is like the wild grape. It is a vigorous grower, being a cross between the Clinton and Hartford Prolific. It will be extensively cultivated, especially in this country where we have a comparatively rigorous climate.

He had raised Downing's gooseberries, which had fruited abundantly, and considered it the best variety, although the past season it had developed some mildew.

Mr. Underwood. I have tried Downing's two or three times, but with me it freezes out badly. It is rather a spraggly grower, does not look like the Houghton, the American, or Smith's, is a more thorny and an open grower.

Mr. Smith. About four-fifths of the bushes sold for Downing's are Americans.

Mr. Stubbs. The Downing shows a good many limbs coming from the ground and the berry is large and handsome.

Mr. Elliot. The Downing that I have is heavier in thorn and limb than either of the other kinds that have been named, is an upright grower and has given me no trouble with winter-killing.

The name of William McHenry, of St. Charles, being called, the assistant secretary said that it was stated by Mr. McHenry, in a letter, submitting a paper to be read at the meeting, that the Russian Mulberry was a humbug.

The following report was then read:

REPORT OF O. M. LORD.

MINNESOTA CITY, January 15, 1886.

To the State Horticultural Society:—

In attempting to report progress from one of the experiment stations, I am reminded of the criticisms on the management of the University farm. The critics are like the boy who desired to see a miracle by planting a pomegranite seed and immediately plucking the fruit. They would ignore entirely the element of time. A chemical experiment may show its result in an hour or a minute and be satisfactory, but the most trifling experiment in agriculture requires at least a year, and in horticulture who shall say how many years? Our beginning was small, and at the end of two years there is little to report except growth and a few additions. The object of the Society in appointing stations was to secure reliable information for the benefit of the people at large, in regard to the cultivation of fruits. In order to secure a variety of soils, and climatic and other natural conditions for experi-

menting, these stations have been as widely separated as possible, and probably have been wisely chosen. The exact location, the particular character of soil, altitude, exposure, etc., should be made a matter of record with the Society for reference.

A general uniformity of selection and distribution of trees and plants among the Stations should be made, to insure reliable knowledge as to their adaptability or desirability for general cultivation. No uniform plan of work has been devised or at least no instruction to that effect has been given. It is supposed that each experimenter has done what he could in his own way. As individuals we are apt to run to specialties, and if we succeed we are liable to jump at conclusions. It is under such circumstances that trees and plants are sometimes largely advertised and sold, that prove to be entirely unfit for general cultivation. I commend the spirit of the nurseryman who stated in his catalogue, that the Hansell raspberry was not adapted to sandy soil. It saved me some money and useless work and probably greater disappointment. If I had been informed in the same manner of the Reliance, and numerous varieties of strawberries, I could have saved myself a good deal of expense and labor. It is hoped that the Horticultural Society through these Stations will secure sufficient tests to enable anyone to plant with a reasonable assurance of success.

The grounds selected for the experimenting here are near the railroad station, upon what is known as table land, lying about thirty feet above the Mississippi river, and nearly level, with exposure about equal. It has been under cultivation twenty-five years. The soil is sandy to the depth of two feet, and underlaid by a foot or more of yellow clay, and then loose gravel. It has never suffered with drouth and the natural drainage is such that it does not suffer with wet. For experiment, and otherwise there are now growing thirty varieties of apple trees; twenty varieties of plum trees; twelve Ostheim cherry trees; eight varieties of strawberries; two of blackberries; three of red raspberries; and the Gregg black; of grapes, the Concord, Delaware and Lindsey; native plums have been and will continue to be a speciality.

FRUIT REPORT FROM O. M. LORD.

MINNESOTA CITY, January 18, 1886.

So far as I can learn, old apple trees are dead, with the exception of the Duchess and the crabs. A large number of young trees have been set, and to all appearances are doing well.

There is considerable increased interest shown in the cultivation of the small fruits; no doubt induced by the failure of apples. The local markets were well supplied with Duchess, Transparent and Hyslop. Strawberries were abundant and prices very low. Currants were scarce. There was a fair supply of raspberries, blackberries and grapes. The indications are that a good many fruit trees will be set the coming season. The Russian varieties are attracting more than usual attention.

Mr. Harris. Mr. President, Mr. Lord wrote me a few days ago that he had found that it was disputed by some that he was the manager of

an experimental station, although he was appointed at our annual meeting two years ago.

President Smith. I remember that Mr. Lord was appointed at that time but I see that his name does not appear in the list.

Mr. Harris. It was an oversight that his name was not published, and I move that his name be properly placed among the names of the managers of Experimental Stations.

The motion was adopted.

Mr. Underwood being called upon for a report said: Mr. President I am not prepared with a written report. If you would just duplicate the very excellent report of Mr. Lord, which has just been read, in case it were found necessary to do so to fill out our proceedings with something of the kind, I think it would very accurately express what I would wish to say. It seems to fit our experience almost exactly. I don't know, if I were to write out a report, that I could improve upon what has been expressed in giving his experience. We have suffered much from the severe winter and there was no way to avoid it, and all we could do was to take it as it came. Even many of the shade trees, Maples, Elms, etc., were more or less injured. The effects of the winter have not in all instances been entirely disastrous, still, more or less injury was done.

Mr. L. E. Day, of Farmington, being called upon for a report, said: Mr. President, I have very little to report. I have just commenced, you know, in a small way, and as yet have only a few cions, but the most of those put in are doing nicely. I am succeeding well, so far as I have gone. Have not done enough as yet to make a report upon, but have done the best I could with what I have had.

REPORT OF J. S. HARRIS.

LA CRESCENT, JAN. 1, 1886.

Mr. President:—I have very little to report in addition to what was brought out in the discussions at our last annual meeting. I have accepted the position of manager of an Experimental Station in good faith, and shall prosecute the work as extensively and rapidly as circumstances will permit. To start with I have but little besides the ground on which to make a beginning. Some cions were furnished me in the spring of 1884, by our former secretary, Mr. Gibbs, including two varieties of apple, two of plums, and one of cherry. I did not succeed in making any of the cherry cions grow. The apple cions lived and made a fair growth the first year, but unfortunately they were worked upon tender stocks, and last winter made a finish of them. Some of the plums are living. I procured and planted a few Cuthbert raspberries and Ancient Briton blackberry plants, both of which are

promising well. The raspberries bore a fair crop of very fine fruit last season. The canes seem to be as hardy as any variety I have tested except the Turner, and the fruit is large and of fine appearance, and will take well in the market. The fruit of the blackberry is superior in quality to the Snyder or Stone's Hardy, but ordinarily they will require winter protection. I also set a few young trees of the Rollingsstone plums donated by O. M. Lord of Minnesota City, and a half dozen of the Pheeney plum procured from E. Markle of La Crosse, Wis., and Moors Arctic from E. Wilcox, La Crosse. The Moors Arctic is a variety of tame plum that is reported as hardy in the State of Maine. The others are natives that have a good local reputation. The natives are doing well, and I hope to have some fruit from them the coming season, and as I have the De Soto I shall be able to compare them together and determine their relative merits. The Moors Arctic lived and made a fair growth the first season, but one of them was entirely killed last winter, and the other considerably injured, but may recover to produce some fruit. They were worked upon native stocks by budding about one foot above the ground, and did not seem to have formed a very perfect union. I think they would do better as root grafts. Last spring I made some additions to the planting, setting a few trees of the Giant Swaar, Rollins Pippin, Wabasha, Red and Yellow Anis, and McMahon White, procured from A. W. Sias of Rochester, and about sixty trees in thirteen varieties of Russians and a few pears, procured of Prof. Budd of Ames, Iowa. These trees were called two-year olds; they were small and inferior looking compared with American varieties of the same age, and some of them appear to be very slow growers and may require nursing an ordinary lifetime before they will be much trees. I think they would do better if grafted upon stocks from Russian seeds. Most of them were secured under numbers instead of names. I set them in my best garden soil, and they generally have made but little growth, and some of them blighted badly. Three varieties, the Antonouka, Anis and No. 4 made a good growth and look well. I also planted three small one-year old trees of the Salome, all looking well. I received some cions of the Brett Seedling from Mr. Sias, and have succeeded in saving enough to get a start. I find that although hardy, the Orange and Strawberry crabs do not make good stocks for working by cleft grafting owing, to a wind in the grain of the wood that prevents their splitting freely. In grapes I have set two vines of Niagara and one of Empire State. They have made a fair growth. I also planted two each of Early Cluster and Wilson June blackberry, and have a few one-year seedling apples that I shall hold for trial.

The following report was next read:

Mr. Sias. I will say that I have put upon trial everything that has been sent to me. Even varieties that I had tested years ago and had found to be worthless, I have experimented with them. A large number of cions sent me by a friend from Maine two years ago made a good growth the first year, but they were not hardy enough for last winter. My report may have very much of a sameness about it, but here is the result:

REPORT OF A. W. SIAS.

ROCHESTER, MINN., JAN. 16, 1886.

Mr. President and Fellow Members:

- Spring of 1884, grafted 11 trees with Pewaukee cions, on Hybrids, all dead.
- “ “ “ “ 4 “ “ Spitzenburg cions, on Hybrids, all dead.
- “ “ “ “ 2 “ “ Wrights Sweet cions, on Hybrids, all dead.
- “ “ “ “ 2 “ “ Yellow Bellflower cions, on Hybrids, all dead.
- “ “ “ “ 2 “ “ King of Tompkins County cions, on Hybrids, all dead.
- Spring of 1884, grafted 3 trees with Wolf River, on Pippin, all dead.
- “ “ “ “ 7 N. W. Greening, on Hybrid, one living.
- “ “ “ “ 4 Robinsons Seedling, on Hybrid, all dead.
- “ “ “ “ 7 Robertsons Red Everlasting on Gen. Grant Crab, all dead.
- “ “ “ “ 4 Oxford Russet Everlasting, on Hybrid, all dead.
- “ “ “ “ 3 Roxbury Russet Everlasting, on Hybrid, all dead.
- “ “ “ “ 5 Vaughn Apple, on Hybrid, all dead.
- “ “ “ “ 6 trees Forster's Red Winter, on Hybrid, all dead.
- “ “ “ “ 4 cions trees Forster's Sweet, on Hybrid, all dead.
- “ “ “ “ 4 cions trees White Astrachan, on Hybrid, all dead.
- “ “ “ April 3d, grafted, 5 cions trees, Ostheim Cherry grafted on small red wild cherry, all dead.
- Spring of 1884, grafted 4 cions trees Red Plum, on wild stock, all dead.
- “ “ “ 4 cions German Rambo, all dead.
- 1884, 2 Coles Quince, grafted on Hybrid, all dead.
- “ 2 Clark Apple, grafted on Hybrid, all dead.
- “ 3 Porter Apple, grafted on Hybrid, all dead.
- “ 4 Golden Russet, grafted on Hybrid, all dead.
- “ 3 Dean Apple, grafted on Hybrid, all dead.
- “ 4 pair Eastern Belle, on Hybrid, all dead.
- “ 2 Red Astrachan, grafted on Hybrid, all dead.
- “ 2 Baldwin on Duchess, all dead.
- “ 4 Bangor Apple on Crabs, all dead.
- “ 2 High Top Sweeting on Hybrids, all dead.
- “ 4 Hovey Apple, on Hybrids, all dead.
- “ 5 Seeknofurther, on Hybrids, all dead.
- “ 2 Northern Spy, on Hybrids, all dead.
- “ 16 trees Longfield, on Hybrids, all dead.
- “ 2 Messenger Russet on Duchess and Minn. Crab, living.
- “ 12 trees Brett Seedlings on Hybrid (stocks not all hardy) 4 living.
- “ 2 cions Lieby on Hybrids, all living.
- “ 1 cion Charlamoff, on Hybrids, all living.
- “ 2 Hibernial, on Hybrids, all living.
- “ 2 Ostrekoff's Glass, on Hybrids, all living.
- Ostheim Cherry trees received from Chas. Luedloff of Carver, doing finely.

REPORT OF M. C. BUNNELL, NEWPORT.

Mr. Bunnell, of Newport, being called upon, said: Mr. President, I have no written report. I find the Duchess and Wealthy are badly injured from the effects of last winter. As regards the Hybrids, I think Whitney No. 20, as a general thing withstood the test very well. Those having Transcendents seem inclined to think well of them, as they bore well; Hyslops did not stand quite so well. As regards plums, the De Soto more particularly gives good satisfaction. Weaver has not come into bearing much in my district. Think both varieties will stand the climate well here. As regards grapes, the Concord and Delaware seem to be the leading grapes and have done very well. The raspberries raised in our section are mostly the Turner and Philadelphia of the red kinds, although some are planting the Cuthbert. It is thought by some, however, to be too tender, that it needs protection through the winter. Of blackberries Stone's Hardy stands at the head of the list, with Snyder next. These varieties seem to be giving very fair satisfaction.

As regards strawberries the Crescent and Wilson seem to take the lead for productiveness and hardiness. There are some other varieties that are being planted there, such as the Ironclad, etc. Bidwell has been planted some but I don't think it will amount to much on our light soil; I don't know what it might do on clay soil. The Windsor Chief may perhaps give very good satisfaction. There are some other varieties of course that are being tested, but I find that in Dakota county the majority of the strawberry growers seem inclined to plant the Wilson, more particularly I suppose on account of their shipping qualities. The Crescent will yield greater crops perhaps than most any other variety we can plant.

Mr. Elliot here announced that a meeting of the Amber Cane Association was being held at the Nicollet House.

As some of the members present desired to attend the meeting of the Amber Cane Association it was suggested that the reading of the paper by Mr. Kellogg be deferred until afternoon.

Mr. Jenkins. I am not one of the fruit committee although I am very generally known among fruit raisers in the northern part of this county and in Anoka county. I am not in the tree growing business although I see a good many. As far as my experience goes I would say from what I have seen that trees were injured some last winter, a year ago; still in my section they have borne a good crop of apples.

I am on the prairie, but near the big timber in the northern part of this county. Those who are raising grapes have had good crops of fruit. The raspberry crop was very good and the strawberry crop was most excellent. The varieties most grown there are the Wilson, Crescent and Countess. The latter variety has done exceedingly well. My own seedlings you all know about and I do not need to mention them.

Mr. Cutler. I made a report as Vice President. I don't think it is necessary to make any further report.

The Secretary then read the following:

REPORT FROM CLARENCE WEDGE, ALBERT LEA.

The blight entered my orchard three years ago and after disposing of the Hyslops and greatly injuring the Transcendents it last season affected every variety in my orchard, the Wealthy and the Maiden Blush seriously, the Duchess, Tetofsky and Elgin Beauty, the Whitney and Briar Sweet slightly. The Wealthy has in some cases thrown up strong suckers, and I am now in doubt whether to save them or grub up the old trees and plant anew.

The Duchess lost the greater share of its fruit buds by the winter, but saved enough to produce a good crop. Rollins Pippin winter-killed outright, while the Elgin Beauty by its side came out fresh and resisted the blight, which I consider a good showing for this variety, considering that it was set the season before and on account of poor roots was barely able to live through the summer.

Through the kindness of Prof. Budd I was able last spring to set out a little orchard of yearling Russian apples and pears, and a few willows and poplars. The apples made a strong and the pears a feeble growth. The willows and poplars were very distinct and interesting. *Salix Laurifolia* is certainly as beautiful as a willow can be, its leaves having a thick glossy polish resembling a heavy coat of varnish.

My vineyard has been the most satisfactory part of my fruit garden, beginning with a half dozen vines cared for in a most ignorant and unsystematic manner, it has ever proven a most reliable and bountiful source of fruit, and such fruit too as made us the envy of our neighbors. I have fruited the Concord and Delaware five years with but one failure and that but partial. The Agawam, Massasoit, Champion and Cottage as two-year old vines bore a few branches last season. The Telegraph and Prentiss although rank growers have failed to ripen any wood for two years and a large share of the vines are dead. For our latitude a variety equal to the Concord and ripening a little earlier I should consider about perfect. The Cottage promises to be of about this description; it certainly is of a much more vigorous habit than the Worden or Moore's Early and I think it may deserve more attention than it is receiving at the hands of the planters of this State.

The De Soto plum is a favorite with us, it is abundantly fruitful and its season being later than that of our wild plum, the time of sitting under our own plum tree is very pleasantly prolonged.

In this stony country the most important horticultural work that our farmers can engage in, is that of planting belts of evergreens that shall fully protect their houses, barns and barn yards; the cottonwoods, willows, etc., commonly planted are a partial protection, but it should be constantly insisted upon that they are not sufficient, and that evergreens are not difficult or slow to grow when properly managed. This is a work that all can engage in with enthusiasm no matter how sordid or unrefined their taste. We bank up our houses and shut them in with storm windows and storm doors, let us also cast up this outer breastwork of green and smile when the storm king rages.

I cannot bring this report to a close without expressing some of that gratitude, which as farmers of this State, we owe to those few brave and enthusiastic men who, overwhelmed by discouragements again and again, have yet led on to the present advanced state of horticulture; what other men of our time have bestowed such comforts on posterity? How might these interests have languished and our homes been left without many of their attractions and endearments!

There is now no room for despair, everything leads on to the hope that this land which already flows with "milk and honey" may indeed "blossom as the rose."

REPORT OF G. W. FULLER, LITCHFIELD.

Mr. Fuller. As a member of the fruit committee I have prepared no written report. In that already submitted I said nothing about plums. The De Soto bore last year and promises to be valuable. The Weaver variety, which was set some four or five years ago, has not borne any as yet. The crop of native plums was very good.

As far as the experimental station is concerned, would say that I have had very few cions sent to me as yet. Have been unfortunate somehow. A bunch of cions sent to me from some source proved a failure. The Russian varieties killed down a trifle but they grew nicely last season and appear to be doing finely. Four varieties were sent me by the Secretary. In the spring I intend making a careful examination and will make a definite report. I cannot report definitely on the varieties received from Prof. Budd.

Mr. Harris. Mr. President, there was no member on the General Fruit Committee from our county to report, and I will merely state that last winter killed the trees very badly, everything excepting the Duchess, Tetofsky and Peach apple. Now, while the Peach apple is the hardiest variety I have upon my place I don't recommend it to people for general cultivation. Not because it is not an ironclad, but it is not productive and it seems to be more infested with this destructive insect known as the *circulio*, than almost any other variety. It seems to be a favorite variety with them. One of my trees had perhaps a barrel of apples but I could hardly find enough perfect speci-

mens for a single plate and I did not exhibit any of the fruit at the Fair as I intended to do. The list of apples that we recommend down there for cultivation is the Duchess of Oldenburg and Wealthy; and for trial, the Duchess of Oldenburg.

REPORT OF F. J. SCHREIBER, MOORHEAD.

Mr. Schreiber, of Moorhead, was requested to make a verbal report.

Mr. Schreiber. Mr. President, I would say that in our cold section of Minnesota there are quite a number of amateurs trying to raise fruit, but thus far the prospects are not very good. I have never received any cions but we are working and experimenting right along. One of my neighbors located near the Red River in a little timber belt has made a partial success with a small orchard of Transcendents.

President Smith. Have you an orchard or are you engaged principally in growing small fruits?

Mr. Schreiber. I have a little of everything; but you know I am located on the open prairie about three miles southeast of Moorhead. I have several thousand trees all told, including evergreens and fruit trees. My trees exist but I cannot say that they are very healthy, at least not so thrifty as I would like to see them. The Transcendent seems to be about the only variety of apple grown to any extent, and that only along the river where there is shelter; some two or three orchards there are doing very well. Mr. Probstfield, an old settler, has an orchard of bearing trees, mostly Transcendents. He has experimented with the "Ironclads" but says there is hardly anything as hardy as that variety, and they are dying off gradually. The Black Walnut is raised there. One of my neighbors has some hard Maples which are doing well. He is also making a partial success with hardy, Russian apples. The orchard is three or four years old but not yet in bearing.

Mr. Underwood. Have you the Russian Mulberry and is it hardy?

Mr. Schreiber. I have a thousand small trees from six to ten inches high. They stood well last winter. I lost very few trees but they were killed back some.

President Smith. How are small fruits, strawberries, etc., doing?

Mr. Schrieber. Quite well. There is an abundance of wild strawberries on the praries. I think all that went into raising small fruits have been making a success of it. Cultivated strawberries are doing well. Evergreens do well; I have several thousand trees. The White Cedar is doing well.

Mr. Cutler. About what growth does the White Cedar make?

Mr. Schreiber. It makes a very good growth.

Mr. Busse. Do you raise any raspberries up there?

Mr. Schreiber. Yes, mostly the blackcaps. I could not tell which varieties do the best, the red or the black. They lay the canes down and some cover with corn-stalks; others cover with earth. As a rule all fruits do better in the timber than on the prairie. Where corn-stalks are used for protection on the prairie there is this objection that the snow drifts, and in the spring when it melts there is too much water on the surface; consequently we suffer more from the water in the spring than from the cold in the winter. In the spring the nights are generally cold and the snow which melts in the day time causes the water to accumulate and it remains for some time on the level prairie, doing much harm to trees and plants.

Mr. Busse. What is the soil up there, generally?

Mr. Schreiber. A stiff clay.

Col. Stevens. It is a black, deep, rich muck, with a hard, clay sub-soil; probably the richest soil this side of the West Indies.

Mr. Kellogg. How are you succeeding with the hard maple?

Mr. Schreiber. One of my neighbors, Mr. Brendermuhle, is growing it successfully. The trees are quite young. We are also growing the White Ash.

Col. Stevens. I would state that many years ago where the village of Casselton now stands, in Cass county, Dakota, on what was then called "Goose Creek," I planted out a good many bushels of acorns and a great many seeds of different kinds of trees. And to my certain knowledge the trees did well there. I did not personally attend to them but Mr. Elliot's gardener attended to them for me. Among the kinds of trees that succeed well in that neighborhood were the box-elder, elm and cottonwood. Of the latter there are some trees there now which I am told are as large around as a man's body, but of course they were planted a long while ago.

Mr. Schreiber. I would state here that I think we should not get our trees too far south as our northern grown trees succeed best. I got a car load of white willows from Illinois eight years ago and planted them on the open prairie there, and I find that they do not thrive, whereas the same variety planted from stock received farther north has proved to be a rapid grower.

REPORT OF R. M. PROBSTFIELD.

The following letter and report of R. M. Probstfield, was then read:

MOORHEAD, CLAY Co., MINN., January, 16, 1886,

S. D. Hillman, Sec'y. Minnesota State Horticultural Society:—

Dear Sir:—Your note of January 9th received. Should have replied at once but for the hope that I would be able to attend the winter meeting of the Society, next week. I am now convinced to my regret that I will not be able to do so. It is a great disappointment to me. As I cannot be with you in the body, I will all the same be with you in sympathy and spirit, and hope for a session abounding in success, profit and pleasure to all attendants, the whole State, and in particular for the good old wheelhorses of the Society who have contributed so much, to make the Society and its meetings a blessing to the Northwestern states.

Very truly and sincerely yours,

R. M. PROBSTFIELD.

REPORT OF SUPERINTENDENT OF EXPERIMENTAL STATION.

By R. M. PROBSTFIELD, Moorhead.

I have very little to report on. First, I would mention that on March 16, last, I received from A. W. Sias of Rochester, the following cions: two Kimball, two McMahon White, two Autumn Streaked and four Hart. On May 12th they were grafted on as thrifty and sound appearing Transcendent stock (top graft) as I possessed, (had no other). I gave half of the cions to Chas. Brendermuhle of Kragness, of Clay Co. Of mine, not one bud started. Brendermuehle reports the same failure. I have been thinking that the cions were damaged during the time of transmission by mail, which was during a very cold and severe spell of weather. Two of the cions looked very bad and shriveled when received, the balance appeared all right. They were kept in a cool cellar in a small box filled with earth, tops of cions about three to four inches out of ground.

I wish to amend my report of date April 9, 1885, somewhat. (Page 296 of Report.)

The Wealthy which I found at that date to have been damaged most, improved wonderfully during the season and got into fair shape for this winter, yet I have no hopes for its hardiness in this region, and would advise experiments on only a very limited scale. Whitney No. 20 is not altogether hardy here, but have still some hopes for it; would advise experimenting with only a few. Beach's Sweet and Sylvan Sweet seem entirely recovered from last winter's damage and I feel encouraged to continue to try them. Transcendent is the only real iron-clad I have tried, but is subject to blight of late years.

Red and white Dutch currants, hardy as the oak here, and good bearers; have no other on trial. Turner's seedling raspberries, which I wintered for the first time last winter was but little injured, without any covering and no snow. The wild raspberry, indigenous here is perfectly hardy, bears well and furnishes a good supply for home use nearly every year.

Blackberries froze completely out last winter, despite the covering of about three inches of soil over the bent vines. Houghton's seedling gooseberry froze badly last winter; no crop of them this year, but they stood the winters fairly well before last winter.

Strawberries froze out completely where not covered last winter; where covered, they came out all right, but crop very poor on account of hot, dry winds at the critical time when beginning to set fruit. Has been so with me for the last three seasons.

As I was very well aware the Society was not in the possession of funds to supply experimental stations with stock to experiment on, I made an effort on a small scale to try some on my own account and applied to Mr. A. W. Sias of Rochester, Minn., for ten kinds of his hardiest varieties of apples, using his own judgment in the selection thereof. After receiving the trees from Mr. Sias, I applied to Mr. A. G. Tuttle of Baraboo, Wis., to supply me with a number of varieties other than those furnished by Mr. Sias, also to make his own selection with the request to consider hardiness above quality. I will here offer my thanks to those gentlemen for the furnishing of those selections at prices which probably will not pay for the work of handling them, showing thereby their earnest striving for progress by experiments in the cause of pomology, in regions heretofore supposed to have been too rigorous a climate to grow apples.

The following is the list of trees furnished by Mr. Sias:

Two Red Anis, No. 985; one each of Early Champagne, 68; Russian Green, 382; Autumn Streaked, 964; Longfield, 161; Somerville Seedling; Red Black, 966; Yellow Transparent, 334; McMahon White Seedling; Red Transparent, 333; Yellow Anisette, 987; Revel Pear, 338.

From Mr. A. G. Tuttle, two each of the following: Yellow Anis, Long Arcade, Glass Winter, Hiberna, Blue Anis, Whitney No. 20, Arabian, Green Streaked, and Enormous.

I shall try to add a few more to this list if I can obtain them, and if any members of the Society, or new members attending, have anything as hardy or hardier not contained in this list, I would like to correspond with them. I should like to try about twelve or fifteen varieties more, if there are that many in existence to-day with any reasonable show of being hardy enough for this climate.

I had intended to apply to Professor Porter of the University for some, but was told that there were no trees to spare for a year or so. I should be glad if anyone could inform me where I can inquire with a reasonable prospect of obtaining a few more hardy varieties not contained in the list given.

President Smith here announced that a number of papers on the program for the afternoon would be read at this time.

The Assistant Secretary then read the following paper:

FRUIT FOR FARMERS FAMILIES.

By O. M. LORD, Minnesota City.

With most farmers, where you have discussed apples, the subject of fruit is exhausted. The cultivation of small fruit is supposed to demand more labor and

skill than they possess, or can command; nearly all, in opening their farms, have set apple trees and some have tried the smaller fruits, but success has not been general. One of the common mistakes has been in the selection of varieties, another has been in starting upon too small a scale. A dozen plants only have been purchased; when the quantity should have been at least a hundred. The smaller quantity is put in some out of the way place and neglected, when a larger number would have received proper attention. If a small quantity of plants is set in some out of the way place, it requires hand labor to care for them, which is always the most expensive and hard to command of any on the farm. Hand labor is really the great bugbear of small fruit raising. If farmers could be convinced that a good supply of small fruits could be raised, with no more work than should be given to a crop of corn or potatoes, many a family would enjoy a plenty that now rarely see any upon their tables. With such as do not like fruit, I have no argument. I have never seen a child who did not like it, nor a woman, nor a man whose taste was not perverted. It is not claimed that we can grow all kinds of fruit in Minnesota, profitably, but it has been demonstrated that we can successfully raise apples, plums, grapes, strawberries, raspberries and blackberries when our climatic conditions are well understood; and when varieties and methods of cultivation are carefully considered our success is reasonably certain.

I shall not attempt to discuss with farmers, the preparation of the soil for fruit raising, the authorities all agree upon that part of the subject. In regard to adaptation of different varieties, to the various soils, too little is generally known. It is, however, well understood that for climatic reasons we cannot depend upon the old standard varieties of apples of the eastern or middle states and that there are kinds that succeed here, no well informed person will dispute. The plums, commonly cultivated at the east and south have not succeeded here, and there are natives indigenous here that compare favorably in quality with any of them, and in character of tree, hardiness, productiveness, and ease of propagation far surpass them. No farmer need be without this very desirable fruit, as this is its natural home, and it is adapted to any variety of soil found here, and to almost any kind of treatment as to cultivation. D. B. Wier, a prominent fruit grower, says he has solved the problem of producing native plums in any quantity, viz: to plant different kinds close together (mainly for fertilization) from four to six feet in rows, twelve feet apart. An indiscriminate selection of trees from the woods is not desirable, a better way is to plant the seed from such as are satisfactory, and continuously select the best; or if a superior kind can be found to propagate by grafting. Experiments have proved that it pays to give the trees of any variety thorough cultivation. They may produce a single crop or more, while standing in the grass, but they will not continue to bear and do well in that condition.

STRAWBERRIES.

Not one farmer in ten is supplied with strawberries of his own growing.

So much has been published in regard to this fruit, that little remains to be said, although its habits of growth, and the methods of cultivation are so well known, failures in the production of fruit are common. Beginners are confused with the numerous kinds advertised, and make mistakes with the varieties in regard to fertilization and adaptability to different soils.

The average farmer cannot afford to experiment, and is easily discouraged with one failure. For such, a few varieties only can be named that are entirely reliable.

The Wilson for clay ground, Downers Prolific for sandy soil, and the Crescent seedling with a fertilizer for either soil, will with proper care, well repay one for time and labor. In order to reduce the labor, I mean hand labor, to the lowest point, this and all other small fruit should as far as possible be placed upon clean ground, in rows of such length that the cultivation can be mainly done with a horse. Rows of ten rods in length are short enough to be conveniently managed. If every farmer would set apart half an acre to be devoted to small fruit, and plant so as to be easily cultivated, the fruit return would pay him a hundred fold besides enhancing the value of his farm in the opinion of any intelligent buyer.

RASPBERRIES.

Raspberries follow strawberries in season, and there is no small fruit grown more easily than the red varieties. After the first year of planting the amount of work given them does not necessarily involve more than is usually given the same quantity of corn or potatoes, and a selection of two or three kinds will prolong the season, till blackberries are ripe. Plants set ten years ago of the Philadelphia and Turner have produced nine good crops, some very large yields, and are still in good condition, without any hand labor except trimming out and picking; the cultivation being done with a horse and small plow or cultivator. Some growers practice trimming in the fall, and laying the canes down, and with a team and large plow turning backfurrows over the rows, claiming that they are thus certain not to be injured by the cold. Others do not disturb the bushes in the fall after picking the fruit, claiming that the surplus bush retains the snow, and thus enable them to endure the cold without damage. The Wisconsin growers pinch back the growing canes to make them branch out, but it is doubtful if this method is beneficial after the first year of growth, with any of the red varieties, while it is absolutely necessary with the black ones to secure large yields. The black varieties were abundant in the market at Winona a few years since. The kinds were Mammoth Cluster, Seneca, Miami, Davison Thornless, and Doolittle; mostly the latter. There are at present some of the Gregg, a disease having attacked the others and nearly or quite destroyed them. The disease was not the well known rust or yellows, but the tender shoots had the appearance of being stung with an insect which killed them. No known black variety will stand our winters as will the red ones, but if it is desirable to try them, the Doolittle is probably the most reliable for hardiness and quantity of fruit.

BLACKBERRIES.

Very few farmers have tried to raise blackberries; where they have tried, they have succeeded beyond their expectations. In addition to the cost of cultivating, they need to be protected in winter. The cultivation does not require much hand labor. The method of protection for winter in a great measure fills the place of hoeing, etc. Farther south it is advised to sow clover between the rows; cutting it and using as a mulch between the hills. That plan is not practicable here. Shallow plowing, turning the furrows to the rows and then from them to keep the surface level and the weeds and suckers down, is the cheapest and easiest way to cultivate them. Large stout canes that have been pinched back will produce the most fruit.

If too many canes are allowed to grow in a hill, they will be so slender as to fall down, making them difficult to cultivate and protect. The season of this fruit may be greatly prolonged by setting early and late varieties. There are no varieties adapted to a wet soil. A clay loam will produce the most fruit, but they will ripen earlier where the soil is sandy.

Besides the foregoing fruits, others might be named, which would well repay the farmer for all necessary cost and labor, but those named including currants involve the least outlay in money for plants and will yield a bounteous return for the labor bestowed.

FRUIT AT NEW ORLEANS EXPOSITION.

Mr. Woolsey. Mr. President, I would like to inquire, if it is in order, if it would not be right to ask some explanation from Mr. Gould in regard to our fruit exhibited at the New Orleans Exposition last winter, as to whether we had received an adequate return for the large amount of money expended in making that exhibit.

President Smith. It is not on the program but I think everyone would be glad to have a short report on that subject.

Mr. Gould. *Mr. President and Gentlemen:*

I would like to add somewhat to the report that I have already made which is published in the proceedings for 1885. At the time I prepared my report I was not well and I made it as short as I could and omitted some things of some interest to the people of the State. I know that many are in the dark in regard to some things which were left out of the report.

Mr. Gould here read extracts from the published report referred to.

Continuing, Mr. Gould said: The arrangement was that fruit had to be in place on the night of the 14th day of January, as the tables would only hold a certain amount; they were calculated for twenty thousand plates. Mr. Parker Earle, of Cobden, Ill., was superintendent of the horticultural department. I had seen him frequently previous to this time and consulted with him in regard to space in Horticultural Hall, and he informed me that I could have all the space on his tables that I would agree to fill. But I will say here that Mr. Gibbs, the Commissioner from Minnesota, was in favor of making the principal display of fruits in the Government Building, which was three-quarters of a mile from Horticultural Hall, and hence there was no chance for an exhibition for competitive prizes in the Government Building. All fruit that was to compete for prizes had to be exhibited in Horticultural Hall. I was in favor of making our principal exhibit

there, but Mr. Gibbs was in authority and preferred to have it made in the Government Building with the balance of the State exhibits, for the purpose of making a very creditable exhibit there, thinking perhaps that it would be of more value to the State to put it up in that way than it would be to compete for prizes at Horticultural Hall. As far as I am concerned I have no opinion to express in regard to that policy at present. It was my wish at the time to make an exhibit of fruit at Horticultural Hall because I wanted to make a show of our fruit. And I will say here that we had very much the best exhibit of Russian apples there; in fact there was nothing of any consequence from any other state in the line of Russian apples. I had about five bushels, comprising eight or ten different varieties.

Mr. Harris. I would like to inquire whether we did not have a sufficient quantity of fruit to make a creditable exhibit in both departments if it had been put up?

Mr. Gould. I had fruit enough to make an exhibit in both places. I could have made a good exhibit in the Government Building and could have used six or eight varieties there without interfering with the exhibit in Horticultural Hall. There was another thing in the way. Everything was behind except in Mr. Earle's department. He had his building and tables ready for fruit the first thing in the Exposition. The official opening was on the 14th day of December and he asked to have some fruit placed there from our State. Only a small portion of the states had their fruits on hand at that time. It was talked up among the commissioners generally that they would not put any up there then. He came down and made a special request that we should take some fruits up there and I thought it was very important to do it, but I was only one. It was the understanding, however, among all the commissioners at that time, with one or two exceptions, that he should not have much fruit.

Our structure in the Government Building was not completed until about the 13th of January, so that we could begin setting up fruit there. On the morning of the 14th, when there was no more time to spare, if we made any exhibit in Horticultural Hall—we had to do it that day—I got Mr. Woolsey, who is now present here, to assist me in taking some grapes up there and getting that exhibit arranged. The committee came around once or twice to ask us whether we had things arranged. The next day, when it was too late, I asked the privilege of taking a few apples up there to see if I could not get them on the tables. Mr. Gibbs was then entirely willing that I should do

so, and I took up a few specimens in a common market basket, carrying them up on my arm, and succeeded in getting two premiums on that lot.

Mr. Harris. Are we to understand that that was all the apples that we had there of our immense collection that came in competition with those of Wisconsin and other states?

Mr. Gould. Yes, sir, that is all; it was either four or five varieties.

Mr. Hoag. I would like to know how our fruits compared with the fruits of Iowa and Wisconsin.

Mr. Gould. Well, there are some testimonials here that I might read which were given by strangers of their own free will who saw our exhibit.

I will say that Ohio brought down some of their Catawba grapes, expecting, of course, to carry off the prize, for they are supposed to be the Catawba people of all the rest of the country. They had some in nice condition; they were almost perfect; the stems were yet green and the grapes well preserved. But those exhibited by Minnesota were the best. The management there are still owing the State Horticultural Society ninety-five dollars in cash for premiums awarded. It is doubtful whether the debt is worth anything. They owe us some medals which they will give us if we will make them. But in this respect we have fared the same as the people from other States. I presume foreign premiums have been awarded, but I do not know. Ohio tried hard to secure that prize, but there was no question that Minnesota had the best. One gentleman of forty years' experience in fruit-growing in New York came to me and inquired if our grapes were grown in the open air. He thought they must have been grown under glass; but they were all grown out doors. Kansas exhibited some seventy varieties, but they did not succeed in preserving them to exhibit them in a presentable condition. I had some photographs taken of our exhibit. I have one left which the Society can keep if desired.

Mr. Harris. What about our exhibit of Minnesota wine?

Mr. Gould. I don't know whether that was entered for competition or not; I was not there.

Mr. Harris. It is suggested by Mr. Kellogg that perhaps the judges drank the wine and forgot to make a report.

Mr. Gould. I think it was used up after I came away. I noticed that apples from different parts of the country varied much in form and color; the apples that were grown on the Pacific coast, especially those from California, seemed to take on an elongated habit. The

Baldwin runs out long and pointed. They have a nice, waxy look. I believe the finest apples I saw were grown in Oregon and Idaho—the largest and finest looking. There was a collection of over one hundred varieties of apples from England, and they had a sort of famished appearance, as if they were starved, the sides being pinched in back of the calyx. I should therefore conclude that England is a poor place to grow apples, and not as good an apple growing country as our own.

On motion a vote of thank was tendered Mr. and Mrs. Gould and Miss Gould for the manner in which they had cared for the fruit exhibit at the Exposition.

AWARD OF PREMIUMS.

Mr. Hoag, from the Committee on Award of Premiums, presented a report which was, on motion, adopted:

We, the members of the Committee on Awards, have discharged our duty to the best of our ability, and report the following:

APPLES.

	PREMIUM.	AM'T.
Display Wealthy, Andrew Peterson, Waconia, - - -	First	\$5 00
Winter Apples, Andrew Peterson, Waconia, - - -	First	2 00
Winter Apples, Willow Twig, Talmon Sweet, Fameuse, Ben Davis, Sweet Seedling, Geo. J. Kellogg, Janesville, Wis.,	Special	5 00

GRAPES.

	PREMIUM.	AM'T.
Best plate, A. W. Latham, Excelsior, - - - - -	First	\$5 00
Best plate, A. W. Latham, Excelsior, - - - - -	Second	3 00
Best plate, Iona, Andrew Peterson, Waconia.	Third	2 00

VEGETABLES.

	PREMIUM.	AM'T.
Best Display, Wm. Lyons, Minneapolis, - - - - -	First	\$5 00
Best Display, H. F. Busse, Minneapolis, - - - - -	Second	3 00
Winter and Spring Potatoes, Beauty of Hebron, J. J. Cale, Minnetonka, - - - - -	First	2 00
Winter and Spring potatoes, Burbank, J. J. Cale, Minnetonka,	Second	1 00
Early potatoes, Ohio, Wm. Lyons, Minneapolis, - - -	First	2 00
Early potatoes, Ohio, J. J. Cale, Minnetonka, - - -	Second	1 00
Onions, Wm. Lyons, Minneapolis, - - - - -	First	2 00
Onions, Wethersfield, J. J. Cale, Minnetonka, - - -	Second	1 00
Beets, Wm. Lyons, Minneapolis, - - - - -	First	1 00
Beets, Basona, G. H. Roberts, Minneapolis, - - - - -	Second	50
Orange carrots, G. H. Roberts, Minneapolis, - - - - -	First	1 00
Orange carrots, H. F. Busse, Minneapolis, - - - - -	Second	50
Parsnips, G. H. Roberts, Minneapolis, - - - - -	First	1 00
Parsnips, Wm. Lyons, Minneapolis, - - - - -	Second	50
Hubbard squash, H. F. Busse, Minneapolis, - - - - -	First	1 00

PANTRY STORES.

	PREMIUM.	AM'T.
Best display canned fruit, William Lyons, Minneapolis,	- First	\$3 00
Best display canned fruit, E. M. Chandler, Minnehaha,	- - Second	2 00
Display Jellies, W. H. Brimhall, St. Paul,	- - - First	2 00
Display Jellies, Wm. Lyons, Minneapolis,	- - - Second	1 00
Mixed Pickles, W. H. Brimhall, St. Paul,	- - - First	1 00
Mixed Pickles, William Lyons, Minneapolis,	- - - Second	50
Home-made maple vinegar, Knight H. Whipple, Northome,	- First	1 00
Home-made maple vinegar, J. J. Cale, Minnetonka,	- - Second	50
Dried apple sauce, Mrs. M. A. Pearce, Minneapolis,	- - Special	1 00

WORKS OF ART.

	PREMIUM.	AM'T.
Collection Paintings, Mrs. J. T. Grimes,	- - - First	1 00
Seedling strawberry, J. W. Jenkins, Champlin,	- - Special	\$2 00
Gregg Raspberries, J. W. Jenkins, Champlin,	- - Special	1 00
Currants two varieties, J. W. Jenkins, Champlain,	- - Special	1 00

We recommend a special premium of five dollars on collection of apples entered by Geo. J. Kellogg, of Wisconsin.

Also, special premiums as indicated in report. (Signed)

M. J. HOAG,

W. E. BRIMHALL,

F. G. GOULD,

Committee.

CRANBERRY CULTURE.

Mr. Tuttle. Mr. President, I would like to speak of one kind of fruit that has not thus far been mentioned. I understand there are facilities for growing it somewhat extensively in Minnesota. I refer to cranberries. It is not really necessary that a man should have a marsh in order to grow cranberries; if you have a flat, or level piece of sandy land, so situated that you can keep the ground moist by allowing a stream of water to flow over it, enough to moisten the soil, you can grow cranberries with success. Some have supposed that it was necessary to have a marsh to raise cranberries, but it is a fact that one of the most successful cranberry plantations in Wisconsin is on a very poor piece of sandy land, where they were accustomed formerly to grow buckwheat. The plants require to be covered in winter with water, but in the growing season sufficient water is required simply to keep the ground moist. There is a plantation of some fourteen acres in our state that I have referred to where they grow eight or nine hundred bushels of cranberries to a single crop.

Mr. Roberts. They have to overflow the land in winter?

Mr. Tuttle. All cranberry ground has to be overflowed in the winter. If the snow covers the ground so as to prevent freezing it answers the purpose, but if not covered in some way the cranberry vines will kill out, and they are quite as tender as the rose. In regard to growing cranberries the great point is to have plenty of water and to have proper facilities for using it at any time in the quantity required, in order to ensure the greatest success. I believe in our state that it is going to be one of the most important of the fruit interests.

President Smith. I have requested Mr. Tuttle to prepare an article upon cranberry culture to be furnished for publication in our report.

The following paper was then read by Mr. Underwood.

ORNAMENTATION OF HOMES.

By J. M. UNDERWOOD, Lake City.

It must be apparent to you all that very little thought is given to the proper laying out and adornment of our homes, for you can hardly find a country home that does not have some conspicuous fault in its surroundings and some of them have very many.

I will try to point out some of these objectionable features, that it may be more apparent to you that a discussion of this subject is necessary and my remark reasonable.

A common error that farmers make in laying out their grounds is to put into the foreground the most objectionable and unsightly of their buildings. Quite likely as you drive by you will see the hog-pen in front of the house, the front fence serving to make one part of the pen. If it was dark and you could not see it, you would know by the smell what was there. Very likely back in an out of the way place, you will find a flower bed wasting its sweetness in obscurity, while the hogs and their filth are made conspicuous.

Near the hog-pen you will find the barn-yard and you may have to drive through the barn-yard to approach the house, in fact I know a well-to-do farmer a highly educated man, that in going to his house one must pass through the barn-yard over a manure-pile and near a hog-pen, before you can get to the door-yard. Then you will not find a place to tie your horse without danger of its being kicked to death by the colts running loose around, or hooked by the cows that share the yard with the colts. Imagine if you can the pleasure of calling for a neighborly chat under exasperating circumstances like these.

These are no exaggerations but actual facts that I can testify to. In a timbered country a woodpile is quite certain to occupy an exalted position in front. If on the prairies we have sometimes seen wheat or other grain almost up to the door of the house. The mistakes I have mentioned are inexcusable and are too disgusting to merit anything but our indignation. In towns or cities it is nearly as bad to see

the barns in the residence portions built out to the sidewalk so that one is compelled to pass near all of the objectionable and unsightly features of a barn. Then how many persons pile their wood on the ground between the road and sidewalk and if they have any wagons or sleighs, rundown machinery of any kind, they find it convenient to store them indefinitely on what they imagine is waste ground. The city officials could abate these nuisances, but they dislike to cause any disturbance or are themselves indifferent to the subject.

In towns a favorite manner of ornamenting the surroundings is to dump ashes out in the street. I know men who for some unaccountable reason, every spring wheel all the refuse of their back yards out into the middle of the street. Tin cans, old hoop-skirts, chips and rubbish of all kinds are brought out to frighten horses and annoy persons driving by. So that in country and town I plead for an awakening to the importance and correction of these objectionable features and a cultivation of the adornment of homes.

In laying out the grounds for a home, one should locate the buildings conveniently to each other, always being careful to keep barns and out-houses in the back ground; or if on the side they should never be farther to the front than on a line with the rear of the house, and all barn yards should be back of this line. The house should stand so as to preserve a good proportion to the surrounding ground, not so far front as to make the front yard seem close and stingy, or so far back as to make the yard appear too prominent. Of course in the country one can and should be more liberal in the use of ground than in towns; but I have seen farm buildings so far from the road as to look as though they had been dropped there by chance with no thought of symmetry or convenience.

A not infrequent error in towns is to crowd the house into a corner of the lot and then in the small remaining space in the shadow of the house and the dense shade of the trees on the street, attempt to grow flowers and shrubs where grass will not even do well.

Choose an elevated situation for the house, and if the ground is level, set the underpinning up high and fill in so as to have good drainage from the house. The wall should show at least 2 ft. above the sod. I have seen houses on side hills set so low that on the upper side the ground came to the base board, and water would run into the cellar. The ground was wet and unpleasant in every respect, when good drainage was so near by. This principle should apply to barns and all out-houses as well. It is a great deal more pleasant to work in and around buildings that are up and out of the mud and dirt.

Having located the buildings, we will proceed to ornament the grounds.

GRADING.

Where it can be avoided I would not plow the ground for a yard; simply sow on blue grass seed and drag it in. In nature no attempt is made to bring everything to a level or even grade. A man's house is his own little world, and why not as far as practicable, have it look natural. If there is a mound or depression in the yard, and it is not out of proportion with its size, let it be, or you may possibly enlarge or diminish the size of either and improve its looks. Rocks, fountains and lakelets and running water always improve the looks when properly introduced, but great care must be used not to give them a stiff and unreal appearance.

When the grading is all done, we will next consider

FENCING.

In the first place, I would not have any more fencing or gates than are absolutely necessary for protection, and in this country where all kinds of stock are fenced, it is not so necessary to fence yards, and no fence at all looks better than a homely unpainted one. In cities and towns I think it looks much better to do without fences, and let the sodding come to the walk, and from the outside of the walk to the road; besides its looking better, it is indicative of the common brotherhood of man, and cultivates a mutual interest in the good appearance of all.

PLANTING.

In the first place select a patch of ground in front of the house, according to the side of the yard that is scrupulously retained for green grass. It must not be shaded by trees or encumbered with anything whatever. It should be of pure blue grass to suit me, well enriched, if possible well watered, and kept closely cut. A few well kept flower and rose beds, near the house, that can be seen from the windows on the south and east sides, are desirable. In addition to these there should be a plat exclusively devoted to flowers, the same as to a vegetable garden; but don't put the sweet flowers near the unsightly cabbages, tomatoes and onions; let them occupy a warm and pleasant spot by themselves, or, if they must be near together, set an arbor vitæ screen to separate them.

Trees and shrubs should be planted in groups. In the country set out a grove of hard maples on the north and west. Three hundred trees will make a good one. Do not set them in rows, but twelve to eighteen feet apart, with no three trees in a line. It will tax your ingenuity somewhat to do it, but it can be done. Plow this grove with one horse and a common stirring plow four or five times each summer, and in a few years you will have a joy to behold.

On the road side and bordering the lanes, plant alternate trees of elm and soft maple; plow these trees also and make them grow. The soft maple will grow up quick and furnish shade, and when they are blown all to pieces by the wind, the elms will be there to take their place. Do not allow crotches to form, and keep the heads well cut back so they will not break with the hard winds. Evergreens can be introduced in groups of three, five or more, according to the size of the yard. A good place for them is in the corners of the yard. If the grounds are large, there should be a group of nice shade trees near by where one can go to rest in their hammock and watch the children playing on the green. Lindens, Maples, Elms or Box Elders are good for this. If you have a fine view in any direction, do not shut it out by anything.

It is always nice to have one or more specimen trees on the ground. If the space is limited, cut-leaved Birch, Mt. Ash, English Alder, Larch, Weep Mt. Ash, or Weep Poplar are good. These should all enter into the adornment of larger grounds. But where one can have them there is nothing handsomer than our Burr and Red Oaks. The majestic branches of the former with its artistic covering of rough bark. The beautiful leaves of the latter that remain on the tree nearly all winter, together with their symmetrical forms, make them most desirable. Do not try to have every tree look as if it had been turned in a lathe. A rough, leaning tree with a limb broken off, looks well in a picture, and a tree artist never fails to introduce them. They give variety and make the place look natural. The Linden is a grand

tree, and I hope to see it more generally used ; it likes to overhang a stream of water, but does well on high ground, is a native and consequently hardy. Never put fruit trees in the front yard, let that be for the picturesque and ornamental alone; let the useful elements come in by themselves where they can receive the care they need.

Groups of shrubs should be planted here and there. In the front or on the side set the low growing ones, Spireas, Weigelias, Hydrangeas, &c., and farther back set Snow-balls, Lilacs, Honey-suckles and Syringas. Or you can put them all on a plat of ground and call it your "shrubbery," setting the higher growing varieties in the background, and the lower kinds in front. Arbor vite hedges look well on borders of driveways. They should be eighteen or more feet from each other and about a foot apart in the row. A nice evergreen border for walks and beds is Juniper Savin, and for an evergreen screen, almost any evergreen can be used by cutting them back severely.

Set a screen out around the back yard to hide the wood pile or any other objectionable feature.

Finally having planted the ground, take good care of it, cultivate frequently, mulch heavily, prune judiciously, and enjoy the reward of living in a beautiful home.

DISCUSSION.

Mr. Fuller. Mr. President, while I am pleased with the paper which has just been read it seems to me that the picture is a little overdrawn, and I fear that it may give the impression that we are disposed to be unnecessarily severe upon some of our farmer friends in various portions of the State.

Mr. Underwood. Mr. President, I won't take back one word of what I have said. I don't set up a man of straw for the purpose of knocking him down again. There are those that cannot educate themselves up to this idea. It is not my intention to make any attack upon farmers as a class at all; I know there are just as intelligent men in the country, who have correct ideas of how to do things decently and properly as elsewhere, but at the same time I do know that there is the least attention given to these things imaginable. It is beyond dispute that there is not the proper attention given by the farming classes to the ornamentation of their homes. Of course on the prairies out where Mr. Fuller lives their surroundings may not be so unacceptable, but it is so at least in Wabasha county, and I can call the names of farmers and men with whom Mr. Fuller is acquainted who have natural advantages for pleasant and attractive homes, but who make them actually repulsive by their carelessness and neglect. It is no uncommon thing to see farmers' homes, where in order to

reach the house, you have to drive through the barnyard and over a manure pile.

Mr. Fuller. I do not question or deny that there are not some instances of the kind referred to, but it seems to me that the impression given by the paper is a very general one; now is that true?

Mr. Smith. Yes.

Mr. Sias. Mr. President, I have been accustomed to travel over various portions of the State for a number of years more or less, in canvassing, and I can safely say that the picture is not overdrawn one particle, and I will agree with my friend Underwood. No longer ago than last fall I had occasion to call on an intelligent man and a good farmer in our county, who resides not more than six miles from the city of Rochester, and in going to his house I was obliged to drive not only through his barnyard, but his hog-yard. And I have been to many such places in this State. I will say that I once canvassed some in the South, in Indiana and Kentucky, and there it was still worse. I don't want to misrepresent our own State, or to make out that it is any worse than others in this respect, but I think that this is not an overdrawn picture.

Mr. Gould. Mr. President, I think that people when they begin to grow fruit are in some way influenced to fix up their homes, to put their back yards where they properly belong. It is hardly right, perhaps, to designate particular neighbors, but I may say here that if one will visit Wayzata, Long Lake, Watertown, and other places I might name, there are a large number of farmers who have taken no pains to fix up their front yards. But it is not so out where I live. Where people get to growing fruit they are apt to put flowers in their front yards and put things to rights. I believe this Society is proving, perhaps, the greatest benefit by civilizing people, elevating their minds, improving their habits and making them better citizens; it is doing much in that way.

The Secretary then read the following paper:

THE SELECTION OF SITES FOR PARKS AND PARKWAYS.

By H. W. S. CLEVELAND, Chicago, Ill.

Few people ever think of a park as anything but a luxury; an ornamental appendage to a city for the recreation and enjoyment of the inhabitants, to which they may resort as a refreshing change from the toils and cares of daily life in the busy streets. In selecting a site for a park, therefore, the first object, in the popular mind, is to secure the most attractive and picturesque area that is available within

easy access of the city, and then to develop and heighten the charms which nature has bestowed upon it, by tasteful and artistic arrangement, and the introduction of artificial decorations of various kinds, such as fountains, bridges, statues, vases, rustic work and ornamental structures.

In arranging the routes for parkways or boulevards also, the primary object in most minds is to secure a drive through the most attractive scenery that is accessible for such purpose. It is not unfrequently the case that tracts of land may exist in the immediate vicinity of a city of a very picturesque character, which owing to that very fact are not available for the purposes of residence sites, because no individual can afford the great cost of grading and draining them and constructing the roads by which they can be made accessible.

In such cases the improvement of a large portion as a park, and the construction of fine roads and ornamental avenues by which it may be easily reached, confers at once such value upon the whole adjacent area that the city is more than paid for the outlay by the addition thus made to the taxable value of the improved property.

The Central Park of New York affords an eminent illustration of this truth. Before its improvement by the city, it was simply a series of wild ledges, of barren rocks with intervening valleys and occasional swamps, where no man could afford to fix his residence on account of the great cost of putting even a small piece of ground in habitable condition, and the fact that even when done there would be no means of access to it. The consequence was that its only inhabitants were of the poorest class of rag and coal pickers, whose wretched hovels were clustered here and there under the protecting ledges in the midst of piles of ashes, giving to the whole district such a dreary and suspicious aspect of squalor that no stranger cared to enter its precincts. I remember well that I felt doubtful of my personal safety when I spent a day exploring it alone in 1856, when the first purchase was made of a portion of it for a park. Now to summarize the effect of the work of improvement of this area by the construction of the park, and making it accessible by fine roads; the whole cost of the park, for the first twenty-five years, including original purchase, construction, maintenance and interest was in round numbers \$44,000,000. During this period the aggregate amount of taxes collected in the wards immediately adjacent to the park was \$110,000,000.

Estimating fifty millions as the utmost increase of value which could have accrued from the ordinary extension of city improvements, there would be sixty millions left, and deducting from that the cost of the park we have the handsome net profit of sixteen millions of dollars.

This shows the wisdom of selecting areas for such improvements which from natural causes are almost valueless until they are thus made habitable; but it by no means proves that it is wise or desirable for the city to purchase large tracts for parks which are already so attractive as residence sites, that the land has attained a high value from the natural advantages it offers. Such tracts are not only very costly at the outset, but there is no danger whatever that they will ever be occupied for objectionable purposes. Instead of seeking only the most beautiful tracts for such use, which already possess great value from their intrinsic advantages, the aim should be to find the localities which from natural causes are avoided by the most desirable class of population, and liable from their consequent low valuation to be occupied for objectionable purposes, and by expending money in redeeming

and rendering them attractive confer upon them a value they could not otherwise attain. If, as in the case of the Central Park, their natural character is picturesque from its rugged and forbidding nature, the style of improvements should correspond, and their chief attractions will lie in the contrast they afford to the luxurious elegance of the surrounding city. But there are other natural causes which often render large areas uninhabitable or so undesirable that they are liable to become offensive districts unless prevented by timely forethought and wise provision for their improvement. It may be that there is danger of malarial diseases from natural causes which can only be removed by the action of the city or perhaps the state, or it may be only that a wide area is of such monotonous character as to offer no special attraction to those whose means enable them to choose a more agreeable locality, and is therefore offered in small lots at a low price and grows into a dreary wilderness of mean or very ordinary streets which are avoided by all but those who can afford nothing better.

There are miles upon miles of such streets in Chicago, lined with cheap and flimsy structures or with hideous cooking tenement houses, pregnant with disease from stagnant pools, foul gutters and filthy alleys, and apparently irredeemable from their squalor by any power short of that exercised in Paris by Napoleon, yet the mode he adopted for converting such quarters into elegant and sightly sections may teach our new and growing cities how to avoid the dreaded evil which only such arbitrary power can cure. Paris was formerly filled with narrow streets lined with low buildings. Now it is mapped out into a magnificent system of boulevards on each side of which are elegant buildings and double rows of trees.—When a boulevard is to be opened through such a precinct, the property is taken by appraisalment, —not only of sufficient width for the avenue, but for one or two hundred feet back from the curb-stone on each side. The avenue is then made and planted, and the land on each side re-arranged and sold in lots with proper restrictions as to the kind of buildings to be erected, and their distance from the street. It is well for us that such arbitrary power of eviction is impossible in our cities, but it is all the more essential that we should take such early action as may prevent the evil which can only be cured by such means.

In the neighborhood of almost all cities there are more or less extensive tracts which possess no natural features to render them attractive, and although no serious objection can be urged against them, are not largely in demand for the erection of fine public or private buildings.

As the city expands these areas fill up with streets and buildings so monotonous in their style that they can hardly be distinguished from one another, and though there may be nothing disreputable or offensive in their general character, the quarters never comes to be considered a desirable one, and can never become a source of such rich revenue to the city treasury as might have been secured by a more judicious arrangement in the first place. The lack of naturally attractive features should have been supplied by intersecting the area with broad ornamental avenues, connecting with parks of greater or less extent, so arranged and decorated with tasteful designs of trees, shrubbery, lawn and flowers as to render them attractive resorts for all coming time. The experience of old cities has amply demonstrated that the creation of such improvements, when judiciously located, never fails to give such tone and character to a wide section of adjacent territory, that sites are eagerly

sought for the erection of fine public or private buildings and splendid shops for the display of the most costly wares.

The whole location thus becomes an elegant and rich quarter, which but for these improvements would never have been other than a monotonous series of streets and blocks, offering no attractions to visitors, whether citizens or strangers. It is obvious, however, that great care is necessary in locating these areas and especially the lines of boulevards so that they may become integral portions of the thickly populated city instead of mere external pleasure drives, and this can only be attained by securing the land at an early stage of the city's growth. Chicago affords an illustration of the danger of delay, for although she has arranged a more extended system of boulevards than any other city in the country, they are all at such a distance from the present thickly peopled districts that a drive of several miles is necessary to reach the nearest of them, and many years must elapse before they can be regarded as city avenues. They are in fact only country roads magnificently arranged for driveways, with here and there a costly residence fronting upon them, but except at fashionable houses, having a deserted appearance instead of the constant throng of equipages and pedestrians which render the boulevards of Paris so attractive.

The obvious importance to the new and growing towns of this section, of timely forethought and action in arranging for these future wants which can never be supplied if we wait till they are felt, has led me to dwell upon the subject in the hope of impressing it the more forcibly upon the minds of all who have it in their power to influence civic authority. No one who reflects upon it can fail to perceive that much of the ultimate beauty, health and welfare of every town which ever aspires to be anything more than a village must depend upon arrangements which can only be secured by the exercise of timely and judicious forethought. And yet how rarely do we see it exercised. There is hardly a city of 100,000 inhabitants in the western country in which the expenditure of very large sums might not have been saved, and millions secured for the future city treasury by early attention to natural topography and adaptation to future wants in its first arrangement. In the course of thirty years' experience as a landscape gardener, I have so often witnessed the almost inestimable losses resulting from neglect of opportunities, the value of which was not realized till too late, that I cannot express too strongly my sense of the danger of delay, or condemn too earnestly the "penny wise and pound foolish economy" which can never look beyond immediate necessity and rise above the meannesses of petty trading.

There is, however, another aspect of the question which is of scarcely less importance, and is certainly of wider significance than the one I have thus far considered. I allude to the reservation for public use, of large areas which from special, natural or other causes possess such interest to mankind at large that the whole world has a claim upon them, as a gift from almighty power which should be held sacred from the modifications to which the greed of man might subject them. The national government has recognized this principle in the reservation of the Yellowstone Park, and the State of New York has followed suit in securing Niagara Falls and a large area of the Adirondack region to be forever preserved as public domain.

Some action has been taken in the Minnesota legislature towards securing an

area around Minnehaha Falls for a similar purpose, but thus far it has been but a feeble effort and no practical result has yet been reached. The region possesses no such features of sublimity or grandure as Niagara or the Yellowstone, but it has nevertheless a sufficient claim for consideration from various causes to render its preservation a matter of vital interest and importance.

It possesses in its natural features enough of the picturesque to make it an exceedingly attractive feature of park scenery, and although it cannot aspire to such intrinsic elements of sublimity as Niagara, it has been invested with such poetic associations as must forever hallow its precincts with a charm which all the world will recognize. When in addition to this we consider the fact that its situation is such that it must of necessity become a central point of a very thickly peopled region, while from its topographical character it can hardly fail, if not improved for public use, to become a disreputable quarter, and a disgrace to both the cities in its neighborhood, the only verdict that can be reached in regard to the question of its reservation, is that it has already been too long delayed.

In regard to other appropriate areas for similar use it is enough to say that a State Horticultural Society could hardly discover a nobler object for energetic action than the seeking out and urging upon the Legislature the preservation of such tracts as may be available whose intrinsic character renders them especially interesting.

In the wide region embracing the sources of the Father of Waters, such areas must exist whose value and interest will only increase with time and population.

The following paper was then read:

EVERGREENS AND THEIR USES.

By A. W. SIAS, Rochester.

This subject is fraught with such magnitude and vital importance to all, but more especially to the pioneer settlers on our northwestern prairies, that it almost staggers a person of human, sympathetic feelings to contemplate it; and every cold blast from the north reminds us again of the stern fact, that it should be the duty and ardent desire of every owner of a quarter section of land on the open prairie, to surround the same with a thorough shelter belt of evergreens at his earliest possible opportunity, and not to forget the shelter of his buildings, stock yards, orchard site, etc., with a closer screen, at the same time. Now what shall we use for this all important business of

SHELTER BELTS?

"Self preservation is the first law of nature." So we will take up this part of our subject first. Did it ever occur to you how few people live up to the kind requirements, superior advantages and happy possibilities of the just law of nature? How wisely, profusely and generously, do we find native evergreen nurseries scattered all over this broad country, where fine plants can be had for almost the cost of digging and packing, and yet how few, comparatively, ever avail themselves of the marvelous wealth stored away in these rich mines. Nature has made ample and abundant provision for all the varied wants of mankind; made it possible through united effort, and the judicious use of trees, to so clothe the earth with

rich verdure as to render the blizzard and tornado almost harmless. Said the lamented Hodges, "trees are the prime factors in the whole business." Will name half a dozen varieties for shelter belts, and class them according to the best of my knowledge as to their merits for screens or wind breaks. There are many more fine sorts that might be named for this purpose, but we do not feel at liberty to trespass further upon the time and patience of the convention, than to just lay some of the claims of these before you, and so open the subject for discussion.

Viz: 1st, Norway Spruce, (*Abies Excelsa*;) 2nd, White Pine, (*Pinus Strobus*;) 3rd, Red Pine, (*Pinus Resinosa*;) 4th, Hemlock Spruce, (*Tsuga Canadensis*;) 5th, White Spruce, (*Abies Alba*;) 6th, Scotch Pine, (*Pinus Sylvestris*;) We head the list with the Norway Spruce, first, because it is capable of resisting a stronger wind than either of the others, unless it is the white spruce, (and that is too small a tree to stand at the head;) second, it has more fibrous roots, hence less loss in planting; third, it is a fine looking tree; Josiah Hooper says, "of all the hardy evergreens this appears to be the most suitable for shelter, dense and compact in its growth, hardy to the utmost degree, and vigorous in almost every soil, it is certainly the perfection of plants for a screen. We must confess to having nothing that will compare with this in valuable tree for all purposes."

State and national pride, when not carried to excess, is noble and commendable—but truth and justice should be held in still higher reverence. And the truth compels me to admit that the Norway spruce has done more to protect, and adorn American houses, than any other tree. In Lapland, we are told, that it grows within 3,100 feet of the line of perpetual snow, grows from 120 to 180 feet in height, and from three to five feet in diameter, and said to be the largest conifer in Europe. "Downing considers it by far the handsomest of the spruces." Next in order comes those old boon companions white and red pine. The white pine is so well known all over this country, that it is only necessary to say, that we have no native or foreign pine, more hardy, larger or by nature so well adapted to shelter belts as this, and as the noble red pine has stood proudly by its side in all past ages, in its native habit. We should not deem it wise to part them when called on to assume their rightful places in shelter belts to guard the lives and fortunes of the pioneer settlers on our western prairies.

4th—HEMLOCK SPRUCE.

To know this tree—"is to love it" and I hope all objections to this sylvan beauty will flee when it becomes generally known that it grows as far north as latitude 65 or 67 degrees, and that all it wants is partial shelter from the drying winds—hence we place it between the pines and spruces in our shelter belts. We have a specimen about 20 feet high, that came through last winter in perfect condition.

5th—WHITE SPRUCE.

It is a fact, that I think is not generally known that the *Abies Alba* is indigenous to southern Minnesota. In passing through Fillmore County twenty-six years ago this winter I found a few of these native trees, some that had been transplanted into settlers yards near by are now about fifty feet high, and beautiful trees. My nearest neighbor, M. J. Hoag planted one of these native trees into his grounds in 1876, for a centennial tree. It now stands eighteen feet high, and blue as the blue-tinted sky, very dense, and perfect in every particular.

6th—SCOTCH PINE.

This is the least desirable tree of the lot, the crookedest, most open headed,—but as it makes a rapid growth, and is hardy, it will do to put on the out side, to guard the finer trees of your shelter belt. Seeds of this tree in Northern Europe are extremely plenty and are being shipped out by the carload, and there is danger of this tree being cultivated too extensively in this country, to the exclusion of our better native pines.

FOR LUMBER.

We are told that “pines made their appearance long before ordinary trees, in what geologists term the mesozoic age.” This accords with all creative wisdom, nothing made in vain, or out of season. The pines, everything considered, for all economic purposes, are doubtless the most useful plants in the whole universe. They were the first trees needed owing to their superiority over all other plants for architectural, mechanical, and perhaps I might add medical purposes. The white pine is the most remarkable tree for lumber in the northern states, and perhaps we might say in North America. Whoever saw a building of any pretensions at all, where white pine was not used in some parts of it? I mean in the north. Most people know there’s a mine of wealth in the pine family for the manufacture of the different kinds of lumber. Evergreen lumber stands unrivaled for general purposes.

ORNAMENTAL HEDGES.

We are not lacking in Minnesota for the very best material for ornamental hedging. The American Arbor Vitæ (*Thuja Occidentalis*) and its many beautiful varieties, are unrivaled for this purpose. In damp, sheltered situations the Hemlock Spruce, (*Tsuga Canadensis*) makes a beautiful hedge. Ornamental trees for extensive home grounds first, Hemlock Spruce; second, Norway Spruce; third White Spruce; fourth, Siberian Fir; fifth, American Arbor Vitæ and its many choice varieties.

Evergreens for grounds of quite limited extent. For this purpose we recommend nothing but the dwarfs, viz.; *Thuja Globosa* Arbor Vitæ, *Thuja Compacta*, *Pyramidalis*, *Siberian Arbor Vitæ*, *Prostrate Juniper*, *Tom Thumb Arbor Vitæ* and other hardy dwarf varieties.

LEAVES.

Gray says: “The actual amount of surface presented by a tree in full leaf is much larger than one would be apt to suppose. Thus the Washington Elm at Cambridge—a tree of no extraordinary size—was some years ago estimated to produce a crop of seven millions of leaves, exposing a surface of 200,000 feet or about five acres of foliage.

Noticing the very long, beautiful, dark-green leaves on the Red Pine, I had a curiosity to know how they compared with the more common, but less desirable Scotch Pine, whose leaves are less than half their length. Knowing that leaves are a most important part of a tree, and should be very carefully studied and compared, one variety with another, in determining their relative value for shelter belts, etc., I cut a branch eight inches long from the ends of the branches of these varieties and counted them, with this result: Red Pine 444 leaves, Scotch Pine 348. Showing a leaf surface of more than double in favor of the Red Pine.

RADIATION OF HEAT.

There is no doubt but what some trees emit more heat than others, and it would be a matter of much interest to know just what varieties are the most valuable in this respect. Will a tree carrying double the amount of leaves of another have any advantage in this respect?

Some twenty years ago, Andrew S. Fuller said: "The pines of our southern states furnish immense quantities of fuel, pitch, tar, resin and turpentine, and so great is the production of the last named articles, that we have exported in a single year more than a million dollars worth, besides the vast quantities used at home." But we need pines in the north for fuel much more than they do in the south, and we can grow them just as readily as they can. Winters like 1884-85, when it gets intensely cold, especially on the open prairies, we need fuel that will produce intense heat in just the shortest possible space of time, and the different varieties of pitch pine will do it. *Pinus Regida* is found in nearly every state in the Union, and is one of the best for this purpose. *Pinus Resinosa* is good. There is a pine found on the Blue Mountains of Oregon in latitude 46° that is equal to our pitch pine in resinous matter, it may prove the same.

The meeting adjourned till 2 o'clock, P. M.

AFTERNOON SESSION.

FRIDAY, JANUARY 22, 1886.

The meeting was called to order promptly at two o'clock P. M., by President Smith.

Mr. Harris stepped upon the platform and said:

Mr. President:

I desire to ask your indulgence for a moment.

About a score of years ago a little band of public spirited men joined together in laying the foundations of this Society. Its beginnings were feeble, but it has survived the dangers of its infancy and is now what we see it, a robust and vigorous youth, full of promise, and is doing more than any other organization in the State to kindle and to gratify horticultural tastes and to elevate Horticulture as a profession. It has been my happy privilege to put in some of the best energies of my life to develop the resources of the great State of Minnesota and to improve its horticulture. I have been in my humble way an advocate of home adornment and of the supplying of the tables of our people with an abundance of fruits and vegetables of every kind, of

surrounding the homes of our people with everything that could in any way contribute to their comfort and happiness in this life and point them to a better life to follow this.

Some of my co-workers have already passed over the river to the beautiful land beyond. I still remain with you, but feel that age is beginning to creep fast upon me. I cannot always remain one of your number, but I hope that my labors may be somewhat remembered and that when you lay me to rest that you can say as you look over the few brief pages of my earthly record, "that man did not live wholly in vain, but he wrought for others, and the little spot of earth upon which he lived is better for his having lived upon it." And to remind you of me when I have passed away I take pleasure to-day in presenting you with a picture taken last week, which I think perhaps is a very correct likeness of the man whose name was first signed to the roll of membership of the Minnesota State Horticultural Society, one who has never forgotten the interests of the Society and never shrunk any duty which he was called upon to perform, but who in sickness and in health, in poverty or in prosperity, has been with you and stood by you, whose best wishes and desire is that the State Horticultural Society may have a brighter future, that it may in its work accomplish the greatest good to the greatest number of people, and in the end convert our beloved Minnesota into the most desirable place of human residence upon the face of the earth. I hope that through your instrumentalities the time may hasten when all our prairies will be dotted over with well cultivated farms and comfortable homes, when the various products raised may be ample to meet every demand and when the richest down to the humblest person may have an abundance of the most luscious of fruits, so cheap that all can afford to partake to their fill.

Mr. Secretary, I place this photograph in the hands of the Society.
[Applause.]

Mr. Sias. Mr. President, I stood by the side of this teacher in the day that this Society was born, and I have been a student under him ever since. I think it was General Lafayette, when sitting for a painting, instructed the artist to "show the wrinkles and all," and I am glad to know that Brother Harris had his fine likeness presented to the Society in the same true-to-life way. A good man might be compared to a birds-eye maple, the more concentric rings it has the greater the value of the tree; and so with Brother Harris, the longer he labors in his efficient and unselfish way for the good of our Society, and for

the cause of horticulture throughout the whole country, the more wrinkles will he carry and all the more firmly will he be established in the hearts of every true pomologist.

Some future day when our Society shall have a fine hall of their own, the likeness of the member who produced the greatest number of object lessons on the first day of our organization, and for many years afterwards, and the member who was always so kind and gentlemanly to all, ever returning good for evil, will not be the least appreciated among the many good pictures that shall grace its walls from time to time as years roll on.

Mr. President, I move you that the Secretary be instructed to place a frame around this picture, and to present it to the Society in that shape.

The motion was adopted.

CORRESPONDENCE.

The following communications were read by the Secretary :

FROM KANSAS.

GENEVA, KAN., Dec. 24, 1885.

S. D. Hillman, Secy., etc.:

My dear fellow worker: Although I have never had the pleasure of meeting you, or in fact, but few of your State horticulturists, I have often wished to do so. Somehow I have never traveled that way, but hope to visit your State perhaps next summer. It has, within the last few months, become my duty, among other things, to meet with the various state societies whenever possible, and I hope it may be so that I can find it convenient to meet with your Society.

I should like to know the plan or rules that govern the time and place of holding your meetings. It is my desire to get some plan carried out by which the neighboring states can hold their horticultural meetings in succession instead of at the same time as is often the case. At present I have a trip laid out to meet the societies of Iowa, Wisconsin and Michigan from Jan. 19th to Feb. 9th. The Commissioner of Agriculture says there is so little money in the contingent fund that we must be very economical in incurring expense. You may not know that he has appointed me "Pomologist to the United States Department of Agriculture," as a step towards establishing a Pomological division in the department which shall serve the country with the aid of the government to back it. Such a thing has never been attempted before in a national way, and it is hoped this move of the Commissioner may be seconded by the permanent establishment of the Division, together with an appropriation sufficient to carry on the work, and then better things may be looked for.

H. E. VAN DEMAN.

FROM WISCONSIN.

FORT ATKINSON, WIS., January 20, 1886.

The program of the meeting of your State Society at hand and examined. It is a splendid one, and judging by your last year's report will be splendidly carried out. We have the reports of most of the states and find none better, and but one or two anything near as good. We hoped to have the pleasure of meeting with you this year, but find it impossible to do so.

We enclose two dollars for which please add our names to the list of members, and if we are entitled to two reports we would be glad to get two.

Wishing each and every member of the Society a happy and prosperous year we are,

Very truly yours,

COE & CONVERSE.

FROM WABASHA COUNTY.

PLAINVIEW, MINN., Jan. 4, 1886.

Yours of December 31st came duly to hand. Would say that we had the hardest winter for fruit last year that we ever had here. The Duchess went through all right; the Tetofsky all killed; Ben Davis, Wealthy and Bethel were all killed. The Bethel has stood the winters for twenty-six years. Some seedlings that stood for twenty-six years went down last winter. On the Whitewater river on low ground the Duchess are all killed. If we keep planting we shall find some varieties that will stand the winters. I have a seedling that is hardy as an oak; this is the second year of bearing. The apples are about the size of the Hyslop, are of fine flavor and show no signs of decay as yet.

Yours truly,

GEO. W. HARRINGTON.

FROM MURRAY COUNTY.

BALATON, MINN., January 5, 1886.

DEAR SIR:

Your favor of December 1, last, and also program of winter meeting came to hand, and I am sorry I cannot this year attend the meeting, but hope to do so next winter. I send you herewith a sort of report of condition of fruit and fruit trees, etc. There is little to report upon from this county yet, as a very small proportion of the apple trees planted are old enough to be fruiting, yet I think the majority of those who have settled this county have some interest in fruit culture and with some direction and encouragement in the way of information of how to do it, they would do more than they have done. The way our farmers buy of the tree-peddler I should say they have a desire to raise their own fruit as well as improve their homes.

It is to be regretted that those peddlers are mostly representing Ohio and Illinois nurseries and sell mostly varieties not suitable to this country. Nevertheless some of our State nurseries have become known, and better results will hereafter follow as these have, and I believe try to sell mostly such varieties as will do the best here.

I feel confident that every farmer throughout southwestern Minnesota can raise all the fruit he needs for his family. We all need enlightenment and information how to plant and care for it when planted; and then I think the time spent and money invested among the trees, bushes and plants will be both pleasant and profitable.

There is chance for work by our State Society in this southwestern part of the State if you can in some way reach it.

Acting on your suggestion as to a county society, I have interviewed some of those most interested, or ought to be interested, and I think we shall have a county society before the next new year.

Deeming it better to do something, if ever so little, than nothing at all, we organized a society for our town on new year's day and though only eight were then present and joined, we shall increase and we shall try and keep alive, at least, till we get a society for the county.

Very truly yours,

O. F. NORWOOD.

FRUIT REPORT FROM RAMSEY COUNTY.

By W. E. BRIMHALL.

ST. PAUL, Jan. 19, 1886.

Small fruits are grown quite extensively in this vicinity. Strawberries were a full crop and were more plentiful in the market than was ever before known. The estimate of the amount sold in St. Paul market during the best of the season was thirty thousand quarts per day. Many of them came into market in bad shape and bad condition, consequently they sold at a low price. Some were sold as low as three to five cents per quart, while at the same time those in good condition and in suitable packages commanded a much higher price.

If growers understood and practiced the best methods of growing and marketing fruit, they would get far better prices than at present. New quart boxes in crates, I find much more profitable than any other shape for marketing berries. The Wilson is yet the king of market berries for all purposes. The Crescent Seedling and Old Iron-Clad range next in our market. The Downing does well on light soil and brings equally as good prices.

Of Raspberries, the red predominate, with Turner, Philadelphia and Cuthbert.

Plums were a full crop this year. Our wild or native plums were all heavily loaded and we have some very choice varieties worthy of cultivation. They require good cultivation and an annual dressing on the soil.

Apple trees came through the winter badly demoralized by the severe cold weather. The Duchess is still the leading variety. The standards were a light crop, being small and irregular in form and size. The Transcendent crab is yet the leading variety and is more generally grown than any other. I sold 1300 bushels of them in our markets. They were hand picked into bushel baskets and carried to market in spring wagons and sold readily, averaging me sixty cents per bushel. Another variety worthy of mention is the Early Strawberry crab. The trees bore profusely. The fruit ripens early and is very nicely flavored.

In conclusion allow me to say, there are fine chances for young men who take an interest in fruit growing, to engage in the enterprise and with due diligence and skillful hands crown their labors with success.

FRUIT REPORT FROM HOUSTON COUNTY.

By J. S. HARRIS, La Crescent.

The only varieties of apples in my orchard that have stood the test of the last three winters without receiving any perceptible injury are the Duchess of Oldenburg, Tetofsky, Peach, two or three other varieties of Russians, Whitney No. 20, and some of the Siberians. The McMahon White and occasionally a Wealthy show but slight injury. A portion of the remaining Wealthy, St. Lawrence, Talman Sweet, Plumb Cider, Haas, and occasionally an Utter, will probably recover and bear fruit, but not become sound trees. All of the Russets, the Bailey Sweet, Seek-nofurther, Winesap, Autumn Strawberry, Fameuse, Pewaukee, the older Red Astrachan and Walbridge, are totally ruined. My experience and observation go to prove that a northeast exposure is the best for an orchard site and that orchards upon high and dry land are less liable to be killed in such extreme winters than those situated in low valleys.

The last winter was the most disastrous to trees of any one I have experienced in a residence here of twenty-five years. I am in no wise disheartened by the losses of last winter, but have full faith in the final success of fruit culture in Minnesota. I shall replant my orchard, using for the purpose, largely, two-year-old trees of the Wealthy and McMahon White, the most promising seedlings I can procure, and enough of the newer Russians to test their adaptability and ascertain which of them are most desirable for cultivation in this State.

My location is in the town of La Crescent, Houston County.

Mr. G. W. Kellogg was here requested to present his paper on Small Fruits for Profit.

Mr. Kellogg. Mr. President, I don't know how many minutes you design to allow me but I will try to be as brief as possible. I must charge it all to my friend Elliot for getting me into this scrape. Before reading what I have written I would like to say that since I left home I received a communication from Hon. Norman J. Colman, the Commissioner of Agriculture, giving the names of some thirty-two kinds of Russian apples of which he has been distributing cions. I received a small bundle of them and two copies of this list.

I should like to criticise somewhat, had I time, some of the reports from our Experimental Stations. One thing that I want to mention is this: when you top-graft any variety on the crab it is no proper trial at all; I think experiments should all be made upon root-grafts. We should grow them from the ground if we want to conduce to their reliability and hardiness.

The Secretary assigned to me as a topic "Small Fruit for Profit," but did not say profit for whom, so I take for granted that farmers are the ones that read your report, and who want the profits.

SMALL FRUIT FOR PROFIT.

By GEO. J. KELLOGG, Janesville, Wis.

Mr. President, Ladies and Gentlemen:

Would you plant for profit? plant for the loved ones at home, health, pleasure and real good cheer.

Every farmer should have one acre devoted to garden and fenced so the fowls will not intrude. I would have this plat 8 x 20 rods so it could be easily worked with a horse. On one side six feet from the fence I would plant for the 1st row—pieplant, currants, gooseberries and blackberries; 2d row—8 ft. x 3, early and late black raspberries; 3d row—8 ft. x 2, early, medium and late red raspberries; 4th and 5th rows—first one 6 feet from raspberries, second one 4 ft. x 2 ft. apart in rows, early, medium and late strawberries; one row I would plant with pistillate varieties, the other with perfect flowering kinds, plants 4 x 2 ft., and I would not let the kinds mix by running together; if my rows were not so long I would prefer to plant 2 rows of each kind and have four rows abreast; for persons having only a single lot I would have the same varieties and quantity to suit surroundings. Let it be kept in mind that one square rod of ground has produced five bushels and over of strawberries in a single season, and one row twenty rods long set with 100 plants has given the following year over 500 quarts.

I would plant one dozen grape vines on the sunny side near the fence, near the house or in an arbor.

If I could have my choice of ground would prefer a deep, rich sandy loam, underlaid with clay and limestone, slightly sloping to the south, so that no water would long remain on the surface, but whatever the soil I would plant and succeed. I would make the ground as rich as I dare for corn,—say forty loads of well rotted manure to the acre, plowed in the fall, and twenty loads more spread on the surface and well harrowed in before planting in spring; the great secret of success in small fruits of extra size, lays in properly applying good stable manure in large quantities, first, before planting and afterward by mulch to protect from drouth and to increase and continue their fertility.

The blackberries and raspberries should not be stimulated to late growth, but so mulched that there need be no failure for lack of moisture in seasons of drouth.

The three great needs for small fruits are rich soil well drained, clean cultivation, and plenty of water.

The water may be applied successfully from reservoirs by trenches better than by hose. If you attempt this artificial watering by hose do not do it while the fruit is in bloom, and make all applications at sundown from water that has stood in the sun at least six hours. It is better to depend on mulching than artificial watering.

Procuring plants is of greater importance than preparation of ground. Such varie-

ties as are succeeding in your vicinity on soil similar to your own, will be a success; be sure these varieties are pure, not taken from an old bed where they are all mixed up or bought of a traveling bumner who cares nothing for you only your money; get your plants from some reliable person in whom you have confidence, and if not acquainted with the kinds take his advice; giving your soil. As soon as the ground will do to harrow well have your plants on hand and set early in spring as possible, if rainy weather interrupts after plants are received, undo the bundles and dip the roots in a puddle made of soil and water, lay them in layers in earth but do not wet anything but the roots. Never water strawberries in the bundle. Set strawberries first, and the buds no deeper than level with the surface of the ground. A spade is the best tool to plant with, let the opening be deep enough to receive the roots without doubling up, but unless you have plenty of money don't dig a hole and make a mound and set the plant and all the roots arranged about in perfect position; it won't pay. All other plants are better set a little deeper than they stood in nursery rows.

The following kinds I have never known to fail when properly treated on any soil: Currants—Red Dutch, Victoria, and White Grape. Blackberries—Snyder, Stone's Hardy and Ancient Briton. Black Raspberries—Tyler, Souhegan and Gregg. Red Raspberries—Turner, Brandywine and Cuthbert. When you treat the suckers as weeds and destroy them or if you wish those that sprout but little, Philadelphia, Purple cane and Shaffer's Colossal, Marlboro, Superb, Hansell and many others I might name, good and good for nothing; among the six red first named you can be suited. Of Gooseberries, plant Downing, Smith's and American Cluster. Strawberries—Crescent and Countess for bushels, Wilson and Windsor Chief for canning and long shipments; Manchester, Miner's Great Prolific, Longfellow and Boone for size, Atlantic and Prince for quality. I will not mention aloud, Rany, Jewell, Cornelia and a host of others on which we expect to make our fortune, nor will I burden you with the one hundred varieties on which I have lost a fortune in the last thirty years.

Of Grapes the best black are Moore's Early, Worden and Concord; best red, Brighton and Delaware; best white, Lady and Niagara; easiest grown of any, White Elvira; best for arbor, Janesville.

Now if there are any farmers who have plenty of ground, or others owning but a single lot, who would like to invest ten dollars at one hundred per cent interest, let me tell you how, and the interest will be paid promptly fifteen months from the investment in that that is better than gold.

Just let your good wife or boy or girl take charge of the garden; you see it is properly fenced so the chickens will not get in, you furnish the ten dollars to buy plants, and if you can buy to better advantage than they, (and all men think they can) procure the plants for them, write to or see some reliable dealer and tell him what's up, and that you don't want anything that won't pay 100 per cent interest, and you want to invest only ten dollars. Keep one dollar to pay express; order 200 strawberry plants, \$2.00; 100 currant cuttings, \$1.00; 150 raspberry plants, \$1.50; 100 blackberry plants, \$2.00; pieplant, 50 cents; gooseberries, \$1.00; grapes, \$1.00; total, \$9.00.

Give the boy the team to draw all the manure he wants, or let the wife or girl have the hired man to do this work, and if you are very particular keep the account

of all time and expenses and charge it up, but mind you want to agree to take and use in the family all the fruit they can raise for five years on one quarter of an acre of this garden at a fair market price.

Now my boy, with the ground properly prepared, have the plants on hand early, but not before the ground is ready to look nicely, set immediately, cultivate and hoe every ten days, keep them clean, run the strawberries up and down the rows forming narrow beds two feet wide, pinch off the fruit stems so as to give vigor to the plants, and be sure to keep the weeds down before they get an inch high.

In November before the ground freezes, take a six-tined or spading fork and loosen about the raspberry and blackberry roots and with the foot at the ground and the fork on the top, tip the plants all one way and cover with earth; from two to five minutes will cover a plant that will give you from two to ten quarts of nice fruit. The grapes cut back to one foot and cover the same. When it freezes so to bear a team, cover the strawberries with marsh hay or straw manure free from weed seed just so you cannot see the foliage, and cover well the patch and outside of the rows. In spring leave this all on, if the plants can't get through open up a little; do not cultivate or hoe until after fruiting, hand weed what is necessary. The plants that have been bent over and protected should be uncovered as soon as frost is out, raised in position and earth pressed around them to hold them up, and a good mulch of manure given them each spring; cultivate lightly, thoroughly, but not deep. Keep this part of the fruit garden clean, and if raspberries and blackberries send up sucker-plants cut them off as weeds.

When strawberries ripen, pick one-half the beds each day, keep account of each day's pick and charge them up at what they are worth in market, but don't compare them with the sour berries shipped a thousand miles.

As strawberries give out, raspberries will need picking—then will follow blackberries.

As strawberries get very plenty, hold the proprietor who furnished the land and the ten dollars to his agreement, eat all you can three times a day, can all you can, and then rather than have any family trouble, buy boxes and furnish your grocer.

An old plan of picking strawberries, cut from Green's Fruit Grower is still often practiced:

The strawberries blossomed and gave great promise of an abundant harvest. It seemed evident that we should not only have a supply for ourselves, but for our neighbors also. Therefore I invested \$10.00 in crates and baskets, for the purpose of marketing our surplus. We did not have the least trouble in getting our berries picked. We had an old hen with a brood of ten chickens that picked every one of these strawberries. The old hen was the most successful strawberry picker I ever met.

Thus I have briefly described the first season. Early in the spring after the first planting, prepare another strip for two rows of strawberries and be sure you set plants that have not mixed; these can be taken from the outside of your beds. Keep the kinds pure, and keep this new planting clean as before—and be sure to set a small bed each spring. The strawberry bed after the first crop will become weedy; cultivate, hand-weed and mow and let it remain as long as it will yield at the rate of 100 bushels per acre; then plow under, for this reason the strawberry bed should be on the outside of the other fruit, these will increase in productive-

ness for four years when the blackberries and raspberries will yield from six to ten quarts of fruit per hill. Your currants, gooseberries and grapes will come to bearing the third year, and at the end of five years if you have not paid for all labor, the land, and all expenses and 100 per cent. interest, beside saving from \$25.00 to \$100.00 doctor bills each year, then I have missed my calling and don't know what I am talking about.

This I consider the best way to grow small fruit for profit, and it will encourage the boy to let him have the proceeds after the family are supplied. If you want to keep the boys at home, let them have an acre and see what they can do for themselves, you will find they will often beat the old man.

Now, I presume many of you expected I would read a paper to tell these veteran fruit growers how to grow small fruit and get rich—you that raise from 100 to 1000 bushels of small fruit every year. I can't do it; but don't spread yourselves out too thin, and try to cover too much ground; don't run after all the novelties. Stick to the old paying sorts, use all the manure you can and not swamp the plants; deep ploughing, heavy manuring largely on the surface, early spring planting, clean cultivation, matted rows, timely mulch, winter protection, good seasons, good pickers, good markets, good prices, and you will be happy.

Grape growing has been and may be profitable to the farmer. Cut back your bearing vines to two eyes of the new wood, put them down and cover; tie them to stakes or trellises in spring, and when the blossoms appear pinch off the shoot, one or two leaves beyond the fruit. The Janesville and Oporto will pay to plant by a dead tree or arbor, and never prune. Go to these when you want sour grapes and try and be happy.

Currants and gooseberries will pay if you give the worms for a change in diet, White Hellebore and Paris Green.

Again I say manure and mulch, and mulch with manure.

I know not what the possibilities of strawberries are. I know of amateurs who have produced five, five and one-half, and five and three-fourths bushels to the square rod in a single season. If this can be done on one rod why not on one acre? Why not grow 1000 bushels of strawberries, the queen of all fruits, on one acre in one year? I know of one man who reported to me of growing five bushels from three plants and their increase, the following year.

The following are cut from Green's Fruit grower since I left home:

"265 quarts of strawberries were grown upon a bed between two and three rods square, selling for \$40.00. The owner in addition, sold \$48.00 worth of plants from this plot. Between the rows of strawberries he had raspberries, picking eighty-five quarts which sold for \$27.75, but you must not plant ten acres expecting such a yield."

E. K. Frost of Chapin, Iowa, with whom I am acquainted, and can vouch for the truth of statement, says:

"I now have nearly all the new, highly prized varieties—twelve on trial, not fruited much yet. I intend to select eight or ten varieties out of fifty now on hand that suit me best, and drop all others. My soil is light, prairie, sandy loam—loose subsoil of firm gray sand, yellow clay and magnesia, well underdrained with rock ten to twenty feet below. No water ever stands on surface unless ground is frozen. Season of 1884 I sold from seven-eighths of an acre 150 bushels of strawberries,

besides home use. We have not been out of canned fruit in eight years—100 quarts now on hand. I am 74 years old; have done all the work of fruit growing except picking; have cleared for my labor \$1,000."

Now if anything I have said or written seems improbable I will refer to the fact that when a boy I was once mistaken for a little Indian; and that reminds me of the drunken white fellow who tried to convince a squaw that they were related. She very indignantly wanted to know "how?" He replied by Adam. She instantly retorted, "me glad it no higher!"

If there is no Indian blood in me I have got nearer to the truth than the Indian hunter did who sold a deer for whiskey. He told the tavern keeper it was on the big tree down in the big meadow; he sent and found the meadow and the tree, but no deer. The Indian's explanation was, "Pretty good for Injun, two truths to one lie."

DISCUSSION.

Prof. Porter. Mr. Chairman, there is one point in regard to mulching of plants or preparing for transplanting. In my experience I have found a very good mixture in which to dip the roots to be one-half common garden ground and one-half fresh cow-dung. I have found that to be the best mixture for puddling that I can use. In the first place you have the advantage of the particular fertilizer in the condition that makes it ready for use for the plant; and in the second place it is impervious to the atmosphere, and prevents the drying out of the small, fibrous roots.

Mr. Smith. It will retain moisture longer than anything else you can get.

Mr. Kellogg. I regret that there is so little time left us for discussion. But I want to say that the executive ability of the Chair is simply wonderful, and I think I have never yet seen in all the conventions I have attended so much real work crowded through in the same length of time.

Mr. Pearce. What do you find to be the best fertilizer of pistillate varieties?

Mr. Kellogg. That is very hard to answer. I use Wilson, Capt. Jack, Countess and Crescent put together; one pistillate and one staminate. I would say in regard to picking strawberries that I never found a person that picked 239 quarts of berries in a day, except where they picked the Countess.

Mr. Hoag. What do you call the Countess; is it identical with the Downer?

Mr. Kellogg. The name originated here; I don't know where the plant originated. Downer's Prolific is claimed to be the same as the

Countess but I have known them to grow side and side and I find they differ.

The following paper by Mr. Whipple was then read :

REPORT ON GARDENING AND SMALL FRUITS.

By K. H. WHIPPLE, Northome.

I find that I am placed in a bad position for me to fill, that is, to give you a report on Vegetable Gardening alone; being so far back from the large markets of St. Paul and Minneapolis and not knowing but a very little about the vegetable gardens there except the daily report of sales. My garden being altogether different from those around the cities, where each gardener selects what he wishes to grow and makes a speciality of, perhaps from three to six different kinds of vegetables and places his whole time on those; while I have to grow all kinds that I can grow including some varieties that I have not yet seen in the Minneapolis market; also, small fruit such as strawberries, raspberries, currants, gooseberries, &c., or in other words, everything that the summer resident on Lake Minnetonka calls for.

Vegetable gardens and small fruits generally around the lake were good.

We had a hard battle with the common enemy of the gardener, known by the name of the cut-worms, they being more numerous last season than ever before known. In spite of all we could do, our earliest planting of beets, parsley, lettuce, raddishes, turnips were all taken,—not one left; and out of 1,500 early cabbage we managed to save between three and four hundred.

The worms are of two varieties, the old gray worm and the other being nearly black and at least one-third longer, and what seems the most singular they are nearly all full grown when they first appear; they seem to have a general concert of action as a large number make the attack at the same time. Several of the small fruit growers complained of raspberry plants failing to grow; on examination we found the trouble to be the work of the cut-worm and cutting the new shoots about the time they were ready to break the ground, which to the blackcap means ruin, and nearly so to the red.

Small fruit where not killed back too much last winter gave us a good crop. In red raspberries the Philadelphia, (all things considered,) were the best, Turner's next and Cuthberts last or least, being tender and killing back the worst.

Doolittle best of the black; Greggs almost a failure on account of winter killing.

Grapes came out splendidly where they were taken proper care of all around the lake.

Apples were nearly a failure, trees being so badly injured the past winter that they could not produce fruit, excepting that variety which so many orchardists and nurserymen have condemned and had stricken from the list of hardy fruit, because they at certain times and in certain localities were troubled with the blight, but in spite of all talk, disease and the cold winters which have played such havoc with our orchards, my Transcendents have stood them all for the past twenty years, and last season I could not discover the first blighted leaf in the whole orchard and the trees were well loaded with fruit. The orchard to-day resembles an old-fashioned New England orchard.

Would it not be best to recommend when setting an orchard at least to set one at each corner of the orchard for landmarks, or for ornament and to give the family fruit while they are living in hopes of something better.

The Secretary then read the following paper by John F. Dayton, President of the Alamakee County Agricultural Society :

AN ARGUMENT FOR THE MORE EXTENSIVE CULTIVATION OF SMALL FRUITS.

By JOHN F. DAYTON, Waukon, Iowa.

Since the recent severe winters have demonstrated that the culture of winter apples in the northwest is almost futile, and the peach and pear cannot withstand the extreme cold of this section, while the cherry seems also to have abandoned us, the inquiry arises, "Upon what must we depend for our fruit supply?"

Fruits are now recognized, not as luxuries, but as necessities; health requires that the system of man receive the benefits of their cooling acids during the heats of summer, and in winter they are equally necessary to combine with the heavier foods of that season. As we are precluded from growing fruit that will keep fresh during the winter months, and as the products of regions with milder climate are expensive, and difficult to obtain except in the larger cities, most persons rely upon dried fruits or the canned products of eastern factories for their supply; in these forms fruits have lost much of their delicate flavors and many of their valuable qualities, and have not the cleanliness and healthfulness of those put up at home.

While horticulturists are laboring to originate and while the earth is searched, in vain so far, for the long-keeping apple, the pear, peach and cherry that will succeed in our continental climate with its violent extremes, we are apt to overlook the fact that we can grow with ease, in any part of the north or northwest a full supply of small fruits, which, canned by the skillful housewife, will provide all the year round a sufficiency of palatable sauces, jellies and fruit acids, so that we may need no more to eat the dried apples wherein the fly hath dwelt, or break our molars upon pebbles called currants, or lacerate our throats with the sand of the desert prune.

The strawberry is a fruit that grows native in localities far to the north of the boundaries of Minnesota, it is proof against the freezing of winter and may be relied upon to furnish a supply of fruit annually.

True it may be said that the strawberry plant is liable to injury by the heaving of the ground under the influence of sunshine and frost, yet this does not occur unless there is thawing as well as freezing, and in northern sections there is less danger than where the winters are more open, the risk here being almost wholly in late fall and early spring. This difficulty is obviated by a thorough mulching of the plants with some loose material, such as clean straw, prairie hay, or sorghum bagasse applied as soon as the ground freezes, letting the mulch remain on the plants in the spring until the freezing weather is over, then raking the mulch into the paths between the rows.

It may also be truly said, that the strawberry is liable to injury by late frosts in

the spring; there are several ways in which to guard against danger from this cause. First, plant varieties that bloom at different seasons, then if one is taken the other will be left; second, leave the mulching over the plants until the danger seems passed; third, do not plant those varieties which have proven particularly susceptible to injury from frost; fourth, if you have done your duty in the premises as heretofore directed, and your plants are uncovered and white with bloom, and you are likely to have a sharp frost, get out all the help you can and cover the plants again with the mulch as with a blanket. The mulch may remain for two or three days without harm and the danger will be over.

I know that this will save a crop which will otherwise be destroyed, and if the winter's mulch is left in the paths between the rows, it is a short job for two or three men to cover an acre of plants. I think I am the first who called attention to this remedy, as I have never seen it in print until in the article prepared by me for the August, 1884, number of *Vick's magazine*.

There is a third difficulty to be overcome in growing strawberries, which is the drouth that sometimes arrives about fruiting time. If you have but a small bed, you can easily water it; a large plantation is much protected by the mulch between the rows and I have watered plants by the acre with a street sprinkler with much benefit. Here in the north we have some advantages. No insect enemies yet to devour the crop, and no rust, leaf blight or like objections to injure the plants; hence, we ought to do as well as growers anywhere and revel in the delight that all mortals feel when eating strawberries. If the ancients had our advantages, Homer and Virgil would never have sung of nectar and ambrosia, but Jupiter and the other gods upon Olympus would have been depicted as subsisting upon strawberries and cream, with an occasional short-cake to make the diet more substantial.

In growing strawberries, use rich soil, give good culture, grow in matted rows not too wide; hill culture is not available, plant in spring, set few varieties, grow *Crescent* with *Finch's Prolific* or *Wilson* for fertilizer for early; *Cumberland Triumph* and *Miner's Prolific* for medium; *Manchester*, *Mt. Vernon* or *Glendale* for late, and if you desire to experiment buy a dozen of some new kind and compare with any variety named and you will probably not propagate the novelty further.

RASPBERRIES.

The raspberry follows the strawberry in season and is next to it in quality. It is not so universally hardy, but some varieties are almost iron-clad. In blackcaps there seems to be two families, the one more slender in growth, ripening canes and berries early; the *Doolittle* and its successors *Souhegan*, *Tyler* and *Ohio* are of this class. The other class is larger in cane and berry, later in ripening fruit and wood and is represented by the *Mammoth Cluster* with numerous aliases and the *Gregg*. The former class maturing its growth earlier, surpasses the latter in hardiness; and being of a drooping habit can be more easily covered in localities where protection is necessary.

The red raspberries are of high flavor, and the *Turner*, I think, is by far the hardiest and best for the north and I deem *Thwack* about as hardy and a better shipper, although not as fine in quality.

Cuthbert is valuable but is injured by winters like that of 1884-5.

Red raspberry plants can be easily protected by weighting the tops down and turning earth upon them with a plow.

Set blackcaps as closely together in the row as possible, they then support each other and do not break down, about two feet apart is the proper distance. Let the red varieties make narrow hedge rows and cultivate or chop out the surplus suckers. Set raspberries in good soil, cultivate thoroughly; always have the rows run east and west; the plants are less liable to injury from our prevalent west winds; are not so much affected by dry weather, and are better covered by drifting snows in winter, than if the rows ran north and south. Do not use any stakes or trellises for raspberry plants, but pinch out the tips of the new growth of blackcaps when eighteen inches high and pinch back the young shoots of the reds, when they show above the foliage. I never protect raspberries or blackberries and have never had Turner, Thwack, Souhegan, Tyler or Ohio injured by winter; Gregg, Cuthbert and other red varieties not named were partially hurt last winter; and gave but a half crop in 1885.

In blackberries, Snyder is superior to any other variety in hardiness, and bears some berries every year, with a full crop generally in alternate seasons. Its suckers less than any other variety and hence is valuable for the garden. Taylor's Prolific is next to Snyder in hardiness and later in season, but is not as reliable.

Do not give blackberry plants any fall cultivation; after they begin to show the berries, stop cultivating until the following spring. If autumn growth is encouraged, it is tender and will not withstand the winter; let the wood ripen early and the canes are much hardier.

There is another class of small fruits which is perfectly hardy, which does not receive the attention that it deserves, viz.: the currant.

If given good soil and culture and heavily mulched during the heat of summer, a crop is almost certain.

The only enemy is the currant worm and this is easily subdued without any injury to plants or fruit by the use of powdered White Hellebore either mixed with flour or combined with water.

In varieties, use Cherry and Victoria, red kinds; White Grape and Lee's Prolific (Black,) and if you have plenty of money try Fay's Prolific, but don't be disappointed, if you find that this much lauded variety only produces currants. Gooseberries are also easily grown and require similar treatment to currants, except that they are subject to mildew in some localities, for which a mulch of soft coal ashes I have found to be the cheapest and best remedy. The American varieties are preferable to foreign kinds.

With the fact that so extensive a field is open to every one having even a small garden, can there be any excuse for not growing a sufficient supply of fruit?

The time spent by an ordinary family in grumbling about the climate and the high prices of fruits, will be sufficient, if expended in caring for a fruit garden, to give an ample allowance.

Then the luxury of fresh fruit, the aroma, the delicate flavor, of that just picked from the home garden, which has not been touched or profaned by foreign hands, is ample compensation for any extra labor, and is something that stands as a reward, not otherwise obtainable, for well doing.

Let us then unite in preaching this new Evangel, for in so doing we shall benefit the health, morals and happiness of the whole community.

Mr. Harris moved that Mr. Pearce be requested to read at this time his paper on Orchard Management.

Adopted.

Following is the paper of Mr. Pearce :

FRUIT TREES AND THEIR ADAPTATION TO SOIL.

By M. PEARCE, Minneapolis.

Growing apples in Minnesota, has been and is at the present time a difficult question to solve. To place each variety on the soil and location to which it is naturally adapted will take time and years to fully determine. The loss of fruit trees is largely due to a want of this important knowledge.

The terrible destruction of fruit trees last winter, viewed from the proper standpoint, should not prevent the re-setting of many or all of the old varieties.

It did not require inspiration or a prophetic eye to tell us, late in the fall of 1884, that most of the fruit trees were doomed. On the first of January we wrote for the winter's meeting, page 409 of the report of 1885, as follows: "The winter has been the hardest on fruit trees we have had for twelve years, and when the facts are known, a sad lamentation will be heard in the west and northwest and all parts of the country." The truth of this statement has been realized by thousands to their great loss and sorrow.

To explain why this occurred as it did and to throw what light we can on the subject we may to some extent here refer to the nature of fruit trees. It is just as essential in order to preserve the health and life of fruit trees by the storing up of food for winter's use, when the roots are not active, as it is for the ox or horse.

During the growing season all the nourishment, or food, taken up by the roots goes into growth, or fruit, except what is used to keep the trees in a normal condition. The sap cells that contain the winter's food are the completion of the season's growth. At first they contain moisture and gas, which if the fall is favorable are soon displaced with starch. By examining the twigs or new wood when this change has taken place you will find them stiff and hard and in condition for winter.

Had the latter part of the fall of 1884 been favorable for fruit trees they would not have killed. The ground was moist, with plenty of rainfall, temperature ran up for several days to sixty-five and seventy degrees, growing heat; the starch in fruit trees in all warm localities, by heat and carbon, was changed to sugar; sap, excited the roots to action, new growth commenced, the bark loosened, buds swelled, and thousands of fruit trees were in bloom on the 20th of October, not only in Minnesota, but over the whole west as well as in other parts of the country. For once in my life to grow apples in Minnesota my faith weakened; I never looked for spring in October. A severe winter followed, and the destruction of fruit trees in Minne-

sota, Iowa, Wisconsin, Illinois and other parts of the country, was far the greatest ever before known.

The record of the past winter and its disastrous results are before us, and all that intend to plant fruit trees in the future should study the subject well, it contains a volume of unwritten, useful information on horticulture that is now in the reach of every intelligent and observing mind. One of the many topics it presents for close observation, where we can learn a valuable lesson that will be useful in the future, is by examining the condition of fruit trees on all kinds of soil, location and elevation, with and without protection. During the last summer we made this a special business and found such a marked difference in the condition of the same varieties of trees, on different soils and locations, that we believe we are now able to select a soil and location on which fruit trees will not kill, taking last winter as a test to judge from. In all cases where the Wealthy came through last winter in perfect condition, there is the best assurance it will stand future test winters. In pursuing our examination of soils and locations we found hundreds of Duchess and Wealthy killed, on other soils and locations slightly injured, and on other soils and locations in perfect condition, having made a good growth and fruited last season. If certain soils and locations will preserve the good condition and life of fruit trees it should be a special duty of all apple growers to be well posted on so important a subject. Why fruit trees so often fail in Minnesota is with me a subject of much interest, and a matter of close observation for years. I am convinced that drouth and heat, at a time when they are injurious to fruit trees, is the principal cause of the destruction of our orchards.

We stated that during the growing season all nourishment went to growth, fruit and the perserving of the normal condition of the trees, against the various drying elements, heat, wind and air. In time of drouth growth ceases, the fruit drops and all nourishment is used to preserve the health and life of the trees; and if the drouth becomes severe, as it often does on some soils and locations, the leaves droop and hang motionless, as is often observed in other plants, indicating lack of moisture from the roots; and when very severe no dew falls; in such cases trees are deprived of all nourishment both from soil and air; when in such condition trees will survive but a few days, not longer perhaps than animals when deprived of food and drink. This important fact should never be lost sight of. Trees from whatever cause deprived of their natural protection are the victims of the surrounding destroying elements.

We will now call your attention to another cause which, in our opinion, has injured and killed more fruit trees than all other causes put together. In another part of this paper we stated that when the growth of the tree is over for the season all the nourishment goes to the formation of starch, which is stored principally in the cells of the inside bark and buds. This starch is a reserve to be used when there is no action from the roots. If it was not so no deciduous tree could survive the mildest winter. They still have the same destroying elements to resist; nature has wisely provided them with the same protection when the roots are not active as when they are.

During the time the roots of the trees are not active, when the leaves are off, late in the fall and winter, the change of stored up food is more rapid at times than

others, when the temperature goes down it diminishes, when it goes up it increases, and when up to growing heat is very rapid; and if the heat continues for a length of time the whole of the stored food or starch is changed to sugar, or sap. This was the case in all warm localities in the fall of 1884 and a new growth was the natural result. In Minnesota there are but few falls when this does not occur to a greater or less extent, on all warm locations, surrounded with timber or heavy windbrakes, with trees planted close together, or in all places where the air and free circulation of the wind are obstructed.

The rapid depletion of stored up food from high temperature late in the fall is the greatest of all destroyers of fruit trees in Minnesota. Trees that ripen their wood the earliest on warm soil are most liable to be injured. The Tetofsky and Yellow Transparent are trees of this class and I have no doubt but many of the new Russian varieties would do much better further north than here, if planted on low land or on quick soil. High, cool, clay land is the best place for all fruit trees in Minnesota. Good protection should be given on the south and in no other place.

The winter of 1884 and 1885 has left sign-boards all over the west and northwest in the shape of dead apple trees; they are found on all low land, in valleys surrounded with hills, or timber, on the level prairie and many other places where the industrious grower spared neither money or labor to shut out the winds from his orchard. There are thousands of acres of land in Minnesota, on high ground, covered in many places with black oak, or Jack oak trees, or brush, too poor for the majority of farmer's to grow their wheat and corn. In such soil the Wealthy stood last winter without any injury.

Fruit trees on the north side of buildings or timber belts are seldom injured. We stated that high land, with a free circulation of cool air is the proper place for all fruit trees that are planted in Minnesota. On such a place all our leading varieties may be planted and expected to do well. But for general planting on all quick, warm soils, we should select varieties that continue longer in growing, and I know of no varieties that fills the bill better than the Wealthy, Duchess, Beeches Sweet and Whitney No. 20. The Tetofsky, Transparent and all other Russian varieties that ripen their wood very early will fail in a few years.

As we said at the start it is absolutely necessary to know the nature of the trees you plant, and plant them on the soil and location to which they are naturally adapted.

Secretary Hillman called attention to a number of fruit reports from the counties of Winona, Wabasha, Dodge, and Murray, which on motion of Mr. Cutler were ordered placed on file for publication.

FRUIT RAISING IN WINONA COUNTY.

By M. KNAPP, Winona.

Having been engaged in fruit culture for many years, I will attempt to answer some of your questions, hoping that my experience may be a help in building up a system which will materially enhance the culture of fruit in the northwest.

I am one of the first to raise strawberries for the Winona market, and have raised them continuously with varied success, having always found a ready home market until within the last ten years, since which time many have been shipped here on the Chicago & Northwestern, as well as to Minneapolis, St. Paul and Stillwater.

I plant in a rich loam with a gravelly sub-soil, and find this to be the best, though they ripen a little later than in a sandy soil. My farm is favorably located for irrigation, and formerly I irrigated the plants every year during the dryest season, allowing water to flow over the bed gently until the soil was thoroughly moistened. This would improve the size of the berry and extend the harvest; but taking the labor and everything into consideration I found there was no profit in it, and have discontinued it for some years.

Have used ashes and horse manure for fertilizers, the latter being much the better, the former seeming to promote the growth of the white clover, which soon covers the ground; the latter, however, shelters the grubworm, which is very destructive to the plant. I have had good success by turning under a rank growth of clover and, later in the season, a heavy growth of corn which had been sowed broad-cast and attained a height of four or five feet, thus making a very rich soil, and yielding several bounteous harvests.

The first variety of strawberry I raised was the Wilson's Albany, and have had them continuously since and found them to be more profitable than any other variety. Have tried the Jocunda, which did not do well in this soil, the berries growing to an enormous size, but the crop being very light. Have also tried the Charles Downing, Crescent Seedling, Manchester, and many other varieties; the Crescent being a good bearer, but if not picked every alternate day the berry will become soft and unfit for transportation. The Manchester are somewhat similar in these respects, while they hold out well for only one or two good pickings.

In regard to protection in the winter have tried various methods; among which have allowed the weeds to grow profusely so as to cover the plants at the time of early frost, but find that this gives the weeds an early start in the following spring leaving the plants weak and unproductive. Have also sown oats broadcast later in the season with the same object in view and with similar results. But have found, after many experiments, that if the bed be kept quite clear of weeds, that a light covering of loose straw, sufficiently heavy to protect the plant from the sudden and severe changes of the weather is the best.

In regard to grapes would say, that I have from three to five acres under cultivation. I started in with the Isabella and Catawba, and later with the Concord and Delaware, which have been the principal market grape. Have experimented with many different varieties, having at times from twenty to twenty-five kinds, with the following results:

The Lindley blossoms profusely but berries fall off, and if the season be moist, they will mildew.

The Agawam has a large but loose bunch, a taste disagreeable to some; strong, rank grower, ripening a little later than the Concord and subject to mildew in unfavorable seasons.

Massasoit is somewhat similar to the Lindley.

Lady, a white grape, light bearer and ripens a little later than the Hartford

The Hartford Prolific is productive and ripens early, but the bunch is loose and the berries fall off very soon after ripening.

The Brighton, Clinton, Diana, Alvira, Iona and Martha need no special mention as none of them have proved to be what was at first claimed for them.

The Moore's Early is a rank grower, yielding a very large berry of excellent flavor, ripening rather early; light bearer.

The Janesville is very good for the early market, being a strong grower, a heavy bearer, small and compact bunches though not of rich flavor.

The Champion, the earliest grape I have, is in every respect equal to the Janesville but of a richer flavor, and will supplant the Janesville in a few years.

The standard varieties, the Delaware and Concord, are too well known to need further mention here. The Delaware have yielded poorly for the last three or four years, probably on account of the vines being too old, and the conditions being otherwise unfavorable.

For the last few years the cut-worm has done much damage on the sandy soils, destroying at least half the crop. They seem to do their work in the night, remaining carefully hidden during the daytime. Will try several experiments during the year in which I hope to destroy or stop the depredations of the worm.

The birds are also very destructive to the sweetest varieties, the robin, thrush, oriole and other small species being particularly destructive to the Delaware and the jay to the Concord. They do more damage some years than others, and one must watch them with a gun. These birds are also injurious to the red raspberries, sometimes doing considerable damage and requiring careful watching.

As to my experience with raspberries, can say that I have raised red raspberries many years with good success; have experimented with several kinds of black raspberries, and though yielding a fair crop, found it unprofitable to keep them and have not had any for several years. In all my experience with different varieties of raspberries I find that they do better with me by covering them in the winter and always feel amply repaid for my trouble.

I plant them early in the spring in a rich soil and cultivate, hoe and trim them carefully for two or three years until the bush has attained its full vigor and strength, when I cut out all superfluous canes leaving but six or eight to the bush, pinning them down and covering them with earth for the winter. Now is the best time to fertilize them which also serves as an additional covering.

I find that the Philadelphia, though yielding abundantly, ripens its fruit during a very short period, and after one or two pickings will all be gone.

The Herstine also yields quite abundantly—a very large and beautiful berry, but the crop is too uncertain as they are not hardy enough to resist our severe Minnesota winters.

Have also for years cultivated several of the common varieties, although none of them possess any great merit, they will do to supply the early market until the larger and better varieties, which ripen later, supplant them.

I have for many years cultivated the Turner and am yearly setting out additional plants at the expense of other varieties. The Turner is a rank grower, hardy and productive, the berry is large and one of the best market berries we have, though a few days later than the other varieties.

I am now experimenting with the Cuthbert, which promises to be a very good berry, in many respects equal if not superior to the Turner.

I have adopted a process of irrigation which I find very valuable; the water is handy and can be utilized with little trouble and expense.

FRUIT IN WABASHA COUNTY.

Mr. Herman Dietrele, of Wabasha, informs us that he has been experimenting with fruit for several years past with considerable success, more especially with grapes and strawberries.

Mr. Dietrele has resided in Wabasha some twenty-four years and about six years ago began the cultivation of grapes, purchasing a quantity of the Concord, Delaware and a new variety, said to be a seedling of the Concord, called Pocklington. This variety was recommended as being hardy, and the vines have made a good growth; but as it has not yet fruited he does not recommend it. He experimented with Janesville three years, but discarded it as worthless, as being of poor quality, and on account of its dropping its fruit. Martha, a white variety, has succeeded well and seems to be very hardy. He says he has had the greatest success with the Champion and Hartford, the former being fully two weeks earlier than the Concord, not so large and attractive, but producing good, solid bunches and fine table fruit; the vines were obtained in Missouri. The Hartford is very productive and early. The first crop from a single vine yielded eleven pounds of fruit. In 1883 he raised a fine crop but it was destroyed by an early frost. The past season the crop ripened well with the exception of the Delaware and the yield was very satisfactory. He obtained from Los Angeles, California, a number of plants of the Black Hamburg and a fine white grape, but found them entirely worthless in this climate.

Mr. Dietrele's experience with the Clinton is of interest. Soon after setting these vines he noticed the leaves were affected by a peculiar disease, which upon close examination he decided to be a malady known as *Phylloxera*. The leaves are covered with white spots which change to a flesh color and soon drop to the ground. Examination with a glass shows the cause of the disease to be that of an insect which, after destroying the leaves attacks the roots of the plants. He applied Naphthaline freely to the vines and succeeded effectually in eradicating the malady. He says he has found the culture of grapes quite remunerative.

He has been growing strawberries to some extent, the Sharpless being his favorite variety; also has Charles Downing and Miner's Prolific. The Crescent require fertilization and soon become mixed with other varieties. He favors mulching heavily with well-rotted manure; planting in rows, cultivating well, and renewing the beds once in four years.

Of raspberries he raises Philadelphia, Turner, Purple Cane and Cuthbert, the first mentioned being hardiest and best. His exposure is to the north and he does not cover the canes.

He has also grown apples to some extent, succeeding best with Duchess and Wealthy, for standard fruit and the Orange Crab, as a hybrid variety. Other varieties of crabs he considers of little value on account of blight. He has a large grove of native plums which bear bountiful crops of fruit.

REPORT FROM DODGE COUNTY.

By W. F. HILLMAN, Kasson.

In answer to your inquiries, I would say in the first place, that I am not a horticulturist, but was a half-farmer once.

Years ago I believe there were two nurseries in this county, one located near Kasson, since removed, and one near Concord village. Some five years since I bought the last apple trees from the Concord nursery that the proprietor could sell (I do not think of his name) before shipping to Dakota, and most of the trees that I bought and took good care of have since died. There is no telling when another nursery will be established in Dodge County.

For a small county—eighteen miles east and west, twenty-four north and south—Dodge County furnishes quite a variation, either in respect to conditions favorable to fruit culture or general farming. The northern portion was largely occupied with heavy timber, and consequently has a dry, rich soil. It was settled at an early date in the history of this State, partly owing no doubt, to its nearness to the Mississippi River markets before the building of railroads, and has been and will no doubt continue to be thickly settled. These and other conditions render this portion of the county much preferable to the southern and southwestern portion of the county, which is more level, wet and bleak, and is not so well adapted to fruit raising.

I need not inform you that though Minnesota can never rank with California or Michigan in fruit raising, on account of less favorable climate, yet there are hardy varieties of apples which will succeed well with us, especially crab apples, some of which almost rival the standard sorts in flavor and other good qualities, together with almost all kinds of small fruits, such as strawberries, raspberries, currants, and the like. The early settlers have given too little attention to these things, for it is well known that we can produce both fruits and vegetables here of more delicious qualities than the corresponding sorts can be grown in a southern climate. The finest fruits can be produced here which the market affords. No doubt horticulture will be developed within a few years to come to an extent that will surprise all but the most sanguine.

Home grown apples have been selling in our local markets at \$1 per bushel for Duchess and seventy-five cents for crabs. But when standard winter apples can be brought from Michigan by the carload and retailed at \$2.50 per barrel, as is the case in our county this year, our farmers of only average intelligence will conclude with respect to fruit raising, that they can get such apples cheaper for years to come by purchasing than by raising them. Where one farmer is too lazy to succeed at anything, (and such cases are not rare,) ten farmers try to cultivate too many acres, or they are too negligent or ignorant, in that particular respect, to reasonably expect much success in horticultural operations.

John Clark, Kasson, is a successful raiser of raspberries for the local markets. A. P. Rose, Mantorville, always has a number one garden and is a good authority on strawberries. Hon. E. W. Westcott, West Concord, is also a successful horticulturist.

FRUIT REPORT FROM MURRAY COUNTY.

By O. F. NORWOOD, Balaton.

There are probably not over two hundred apple trees in this county, exclusive of the crabs that have come into bearing as yet; but those that are old enough bore a good crop, especially Duchess and Wealthy. Not many of the latter bearing yet.

The Transcendent with us have borne a good crop the last three years. Trees of this variety, fifteen years old, have shown no blight here yet.

Raspberries a good crop though a little under average size. This was probably caused by lack of moisture, no rain having fallen for three weeks previous to the ripening of the crop.

The Gregg, we think a splendid raspberry for this country. This and Turner about equally hardy with us; both have stood the winters without protection, except last winter they suffered slightly. Souhegan not hardy.

Red currants were a good crop, but not as good as in 1884.

Gooseberries, (Downings,) have generally been plenty, but this year the bushes were infested with worms, nearly an inch long and resembling the cabbage worm. These pests made their appearance here this year for the first time, but in several places, and there was very little fruit.

Native plums planted in the garden were loaded with fruit, and with proper care they are a fair crop most every year.

Strawberries, a big crop, especially Crescents.

Grapes: we have fruited only the Concord and Clinton. Concord a small crop and of poor quality; the two previous years we had a nice show of fruit on these vines. Had a fair crop from the Clinton. We think we gave the Concord vines insufficient covering, which was the cause of failure this year.

I have made inquiries throughout this county and find no injury to apple trees from the severe weather of last winter, which is encouraging to us here, when we consider the damage done to orchards in other parts of the State more favorably located than ours.

The following paper was then read by J. T. Grimes.

CONIFEROUS TREES OF THE ROCKY MOUNTAINS.

THEIR VALUE AND ADAPTATION TO THE TREELESS PRAIRIES OF THE NORTHWEST.

By D. S. GRIMES, Denver, Col.

For stately grandeur in form, and beauty in color, the Evergreens of the Rocky Mountains are unsurpassed and stand as worthy companion landscape pictures to the grand scenic surroundings of their Alpine nativity; the canons and lofty snow-clad peaks of the Great Continental divide—the Switzerland of America.

The natural beauty, symmetrical form, location in altitude and in latitude, together with the conditions prerequisite for extreme hardiness, and the rapidity of growth of some of the most desirable varieties, pre-eminently fit them to grace the lawns of refined homes, and especially for wind breaks and timber culture, should receive a hearty recognition.

From my long residence in Colorado and extensive knowledge of the Rocky

Mountain forests and from observation and practical experience with the Conifers of this elevated region, am fully convinced that the varieties of evergreens best suited to endure the climatic conditions of the arid plains and prairies of the new west, must come from the Rocky Mountains. From experience we find they readily adapt themselves to the greatest extremes of atmospheric changes wherever introduced.

The intelligent and progressive people of Minnesota, as well as those of her sister prairie states, must admit that the most effectual and durable barrier against the storms that sweep over the country will be found in extensive tree planting. But the planting of trees for shelter and wind breaks is but a small part of the value of such work.

It is a singular fact that while the lumber commerce of the world is largely supplied from coniferous forests, aside from our parks and lawns, very little attention or importance is attached to the planting and cultivation of this valuable class of trees.

In this progressive age of prairie settling where homes are to be made, the planting of suitable varieties of coniferous trees for timber and shelter should be encouraged as a matter of the first importance.

Failure in successfully growing evergreens, often has its origin in the adaptation of varieties and for local causes of which the atmosphere is one of the most important.

On account of the aridity of the air both summer and winter, the Missouri slope west of Kansas City and north of Omaha is not adapted to the class of evergreens commonly planted in a more humid climate farther east.

On the other hand, the natural aridity of the atmosphere and the extreme degrees of cold that frequently sweep over the Rocky Mountains, have created varieties of forest trees suitable by acclimation and adaptation to a wide expanse of country extending as far east as this peculiar influence exists.

Not only are the Rocky Mountain Conifera well adapted to these arid and arctic influences which characterize their native surroundings, but in the moist atmosphere of the Atlantic coast and in Europe they seem to flourish with equal health and vigor.

Of the score or more varieties of evergreens seen growing in various localities on the Rocky Mountains we call attention to only a few of the most beautiful and valuable; introducing in their behalf the testimony of men well and favorably known in horticultural pursuits.

The *Abies Douglasii* (Douglas Spruce) heads the list as the coming evergreen for the prairies. Rapid in growth, beautiful in form and color, wood durable and valuable, its soft foliage and flexible branches enabling the tree to safely resist a heavy weight of snow or strong wind. By judicious pruning and clipping, they can be made to grow in any form desired and are equally well adapted for ornament and usefulness.

Downing says in his description of the pinetum at Dropmore: "Perhaps the finest tree in this extensive collection is the Douglas Spruce. It is sixty-two feet high, and has grown to this altitude in twenty-one years from seed. It resembles most the Norway Spruce, as one occasionally sees the finest form of that tree, having that graceful downward sweep of the branches, and feathering out quite down to

the turf, but it is altogether more airy in form, and of a richer and darker green color. At this size it is the symbol of stately elegance." The late Prof. F. B. Hough, Chief of Forestry Division, United States Department of Agriculture says: "The Douglas Fir (*Abies Douglasii*) is incomparably the finest of the firs, surpassing them all in size and equalling the best in value as a timber tree, and is found to withstand the drouth better than most conifers, while it equals or surpasses most of them in growth." Thomas Meehan in his valuable "Gardener's Monthly" in speaking of it, says: "Raised from Colorado seed, this fine tree has proved itself perfectly hardy in the very low temperature and severe winds of the north-western prairies, and in eastern Massachusetts where it has stood entirely uninjured during the last sixteen years, although plants raised from seed from the Pacific coast are quite tender and unable to endure our winters." Robert Douglas of Waukegan, Ill., the most extensive grower of evergreens in the world, having fully tested seeds planted in his grounds from California and Colorado, says that "trees from seed collected in California proved not hardy, while trees produced from seed of the same species, collected by Prof. Parry, from trees on the Rocky Mountains in Colorado, were perfectly hardy."

Abies Menziesii.—According to De Engleman, the Colorado *Menziesii* is *Picea Pungens*, and not the *Menziesii* of California. This tree commonly called the "Blue" or "Silver spruce" of the Rocky Mountains, must be seen to fully appreciate its faultless beauty. They are, however, rare, and seldom met with. They are found growing at from 7,500 to 9,000 feet altitude, in rich, moist, alluvial soil, at the foot of the mountain, near a stream of water. On account of their peculiar glaucous color and symmetrical form, they are much sought for. In Denver they take the lead of all others. Referring again to the "Gardener's Monthly" Mr. Meehan says, "It was a good winter (1879) to test the point made by Professor Sargent that *Abies Menziesii* of Colorado is much better adapted to endure eastern winters than a *Menziesii* of the Pacific coast. We (Meehan) examined recently some specimens in Germantown that had been through the winter side by side, and found all the Pacific plants with their leaves off, while the Colorado specimens had not a leaf injured."

The Colorado form is known in nurseries as *Abies Menziesii* Parryana, we suppose named in honor of Dr. Parry the celebrated American botanist, who years ago collected and distributed to professional growers seeds of the Rocky Mountain Conifer." This species, says Thomas Meehan, has been tested at various times on our northwestern prairies, enduring a temperature of 30° below zero without injury, and also very extensively near Boston where it has stood out entirely uninjured during the last sixteen years. This is not only one of the hardiest, but the most beautiful of all spruces.

In April 1860, John F. Baldwin of Olney, Iowa, dug some *Menzis* spruce out of the snow up on the Rocky Mountains. When dug they were less than two feet high. They were packed in hay, nothing better to be obtained and hauled across the plains in a wagon to Iowa, being over a month on the way. In Mr. Baldwin's report to Prof. Sargent in 1880 he says, "these trees are now twenty-five feet high, and are very hardy, having withstood the most severe winters without being the least killed back."

He considers them as hardy and beautiful as any tree found in the country.

About seven miles north of Oceola, Iowa, are seen two beautiful specimens of the Blue Spruce. These trees were also brought in a wagon all the way from Pike's Peak by a gold mining adventurer in 1860. The man becoming tired of hauling them, sold out to a farmer who succeeded in raising two of them. In planting, a quantity of stones was mixed with the soil around one of them. This tree had made double the growth of the other.

The Pungens or Blue Spruce in Colorado shows a marked tendency to *sport*, both in the color of the leaves and the growing habit of the lateral branches. While the foliage of some trees exhibit a full, rich, glaucous blue, both above and below, making them conspicuous objects as far as the tree can be seen, others in the same group, take on different degrees of color, from a tinge of silvery blue above, to a dark green beneath. The natural order of the branches are rigid and fan-shaped, drooping in regular folds one above the other. But in many trees of mature growth are seen great numbers of flexible branches from six inches to a foot in length, hanging pendulant from beneath these folds, waving with the least bit of air that stirs.

This peculiar weeping habit contrasting so strangely with the general stiff and stationary character of the tree, does not appear in younger trees, neither is it confined to any shade of color in the foliage. So regular is the arrangement of the over-lapping branches of this rare and beautiful Spruce, that often times when caught in drenching showers of rain, we have found secure shelter under the "blue forest banners of the Rockies." In point of stately elegance and grandeur it stands a fitting representative and often reaches a height of eighty feet. The cones are borne sparingly on the side branches, but on the top or apex, they cluster in such quantities as to almost hide the leaves, where they hang pendulant for two years.

This head decoration of light-brown cones covering a few feet only of the extreme top, makes a fine setting off to the gay colors below.

As a hardy, rapid growing ornamental evergreen, the Blue Spruce of Colorado has no superior.

Abies Englemann. (Engleman Spruce.)

In hardiness, this Spruce is a true "iron-clad," having withstood the severe climate of St. Petersburg, Russia. It is also a tree of high altitudes, growing up to "timber line" on northern exposures. The best specimens however, are found at an elevation of about 9,000 feet, along side *Picea Pungens* and *Abies Grandis*. The leaves are short and thickly set on slender branches, of a dark-green color, with a small stripe of white above and below.

These lines of white stomata are not so plain in a specimen seedling grown and sent us by Robert Douglas, as they are generally seen in their natural habitation on the mountains. This apparent difference may be caused more from altitude and climate than from any difference in species.

All trees and plants found growing in Colorado exhibit a much lighter color in leaf and bark, than the same varieties grown in lower altitudes.

The wood of the Engleman Spruce is soft, white and valuable for timber, and for ornamental purposes, we place it in the front as a companion picture beside the *Menziesii*.

Abies Grandis (Great Silver Fir). Of all the new and rare conifer that it has been

our pleasure to test, not one excels this in our estimation. We have grown it in the open air for ten years, and entirely unprotected, it has withstood the most severe cold and intense heat with equal unvarying success.

"Our oldest specimen is the admiration of everyone who sees it, and is a living proof of its availability to our cultivators in the Middle States. As to protection during the winter it has not needed the slightest." (Hoop's Book of Evergreens.)

For stately grandeur and form of growth the *Abies Grandis*, as we see it in its Sub-Alpine to Alpine home on the great Continental Divide of the Rocky Mountains, is the true ornamental type of a perfect tree. Erect, straight and smooth as an arrow; leaves silvery green; branches fan-shaped, spreading in regular folds or layers one above the other; the lower branches pendulant the upper ones ascending, the wood soft and white and free from resin.

The appearance of the Great Silver Fir, with its flexible branches gracefully waving in the breeze, forms a marked contrast with its rigid, natural neighbor, *Pinus Pondurosa*.

This species of evergreen seems to thrive best in a cool, moist, rich, porous soil.

In many instances we observed, where the lower branches had been pressed to the ground by the heavy weight of snow, they had taken root and formed new trees, a la Bunyan. From this we infer that propagation from layers and cuttings would be easy.

Although Nuttall, Douglas and other celebrated botanists, have located this exceedingly lovely tree on the Pacific coast, from Northern California to British America, and we too have seen large forests of it, on Mount Ranier near Puget Sound. We have also found it growing on the head waters of Boulder Creek, near Cariboo and even up to timber line, at 12,000 feet above the sea—an altitude higher than most of the clouds that float over the Eastern States.

PINES.

Pinus Contorti—Twisted branched Pine.

Contrary to what the name would seem to imply the *Contorti* is a slender, straight, rapid growing tree. The branches are numerous, slender, twisted, thickly covered with leaves, two inches long and two in a sheath. The color of the leaves is a pale green, rather pleasing to the eye.

As an ornamental tree it is quite pretty when small, but in its natural element, inclined to grow tall and slender. The wood is white, light and strong.

The first settlers of Colorado fenced their farms with the poles and built their cabins from the larger trees. They are found growing thickly on northern exposures along the mountain slopes and extending up to the highest elevations.

While this species of pine is of but little value for lumber, it is valuable for railroad ties, telegraph poles and mining timbers.

Pinus Pondurosa—heavy wooded pine.

The leaves of this Pine are a very dark green, nine to ten inches in length; three in a sheath.

The branches of *P. Pondurosa* are more open and scattering than the *P. Contorti*, yet as an ornamental tree, especially in a collection where the brightest and deepest shades of color are artistically arranged in landscape architecture this tree would

fill an important place. It is as hardy as any tree that grows, and for lumber the most valuable pine found growing on the Rocky Mountains. The timber is heavy and durable, and not liable to warp.

Extensive forests of this valuable timber commonly called Yellow pine in Colorado, are found growing from 8,000 to 10,000 feet altitude, on dry elevated table lands, that are common to those higher mountain regions.

Prof. H. W. Sargent in his supplement to "Downing's Landscape Gardening," speaking of the *P. Pondrosa* says: "It is the hardiest of all pines, not excepting our native White pine, and the fastest grower. We have a tree eighteen feet high, raised from the seed in seven years; gigantic in every sense of the word. The new shoots are two or three times as thick as those of the white pine and the same with the buds. The annual growth of the leading shoots, exceed a yard in length."

Our experience with this pine in the Denver Nurseries fully corroborates Prof. Sargent's record. Not only is it a rapid grower but the wood is durable. We know of posts planted in Colorado soil twenty years ago, apparently as sound as when first set in the ground.

In their native mountain forests, where the seeds have dropped along those old abandoned trails or road ways, or in anyway are covered, even with the poorest soil, leaves, or stone, they germinate and throw up a rapid growth. Where a fast growing and valuable variety of timber is the object desired in timber culture, we know of no tree so well suited to the Northwest as this heavy wooded pine of the Rocky Mountains.

Before concluding our remarks on this interesting and valuable class of trees, we think our work would be incomplete, without adding the testimony of the late lamented Dr. John A. Warder in one of his valuable papers on forestry, written during his official term as President of the American Forestry Association.

He says: "The spruces of the Rocky Mountains though still comparatively rare deserve a share of your attention, especially the *Picea Pungens* formerly called the *P. Menziesii*, the silver spruce of those mountains; the *Picea Englemanni* and the *Abies Douglasii*."

All these trees are very beautiful; but you must be warned not to import them from Europe. Look to the Rocky Mountains themselves and not to the Pacific Coast as the original supply of these trees.

Mr. Cutler presented the following paper:

NOTES ON FORESTRY.

By M. CUTLER, Sumter.

Mr. President, Ladies and Gentlemen:—

The subject of forestry is one which I feel myself incompetent to properly handle. It is one demanding the greatest consideration by the people and law-makers of our whole country. Our noble forests are rapidly passing away before the merciless power of the axman's hand. And where, in the memory of the writer, a large part of Western New York was covered with the monarchs of the forest, to-day it is nearly as barren as the prairies of the west. Drouths and floods are of common occurrence, fences have nearly disappeared, and most of the fuel supply is obtained from the coal mines of Pennsylvania.

But this destruction is not confined to the east; fifteen years ago the country from Lake Calhoun to Glencoe was an almost unbroken forest. To-day, the whole surface is dotted with farm houses and clearings.

When I came to Glencoe the prairie west of there seemed a dreary waste, with here and there a solitary house, looming up against the horizon, like a ship at sea. The wild deer roamed over the prairie and through the forest. One small cottonwood grove at New Auburn was the only one in sight. The wonderful change that has been wrought is best illustrated by the exclamation of an acquaintance, when, on a beautiful May morning, he says: "Where will you find a more beautiful land than this? Whichever way the eyes turn, beautiful groves and nice farms are seen." This fact slightly compensates for the destruction that has taken place; but there has not been a tree set where there should have been a hundred.

If there is one place more than another where the benefit of tree-planting is felt, it is on the prairie west of the Big Woods. As the oasis to the weary, hungry and thirsty traveller on the sands of Sahara, or the harbor to the tempest-tossed mariner, so is the grove of cottonwood and willow to the dweller on the prairie. He knows that although the winds may howl and blow at the rate of sixty miles an hour, peace and quiet reign in its shelter. Methinks that if one of our prominent members, who states in a recent number of Farm, Stock and Home that the cottonwood and willow were not worth mentioning, and who expressed his surprise that farmers continued to plant them, recommending larch and maple instead, was to stand on the west side of a grove of these despised trees, with the wind blowing a gale and the thermometer at forty degrees below, he would hasten to their shelter and exclaim with Brother Sias, "God bless the cottonwood and willow."

Most of our farmers are poor when they settle on the prairies, often many miles from timber; maple and larch trees cost money, while cuttings of the others may be had for the asking. Again, the rapid growth of these afford shelter and protection before the others hardly commence to grow. But think not that I have aught to say against the larch and maple; the first has been my admiration from youth up, owing to its tall and graceful form. It reminds me of the days of 1860, when the tallest specimen in my father's swamp, in connection with a noble white ash furnished by one of our neighbors, was made to bear the name of Lincoln, and helped to kindle the fires of patriotism in the hearts of the people. That this variety will succeed on our prairie soil has been proven by my neighbors, who have fine specimens growing in their yards.

In connection with the trees named I would recommend planting different kinds of walnuts for nuts and timber. The importance of forest trees to the man that has the courage to attempt the growing of fruit on our prairies was fully demonstrated last spring. Small fruits on the east side of groves being in good condition while those on the west side, exposed to the winds, were badly injured.

And now fellow members let us by example and word in every possible way encourage the planting of forest and ornamental trees, knowing that although we may not reap the full benefit, our children will bless us for so doing.

Let us together take our stand,
To stay the wily axman's hand,
And make of this a fertile land
Instead of one of drifting sand.

The following paper was placed on file for publication :

THE TRANSCENDENT CRAB.

By C. L. SMITH, Minneapolis.

After twenty-five years of trial in Minnesota, the season of 1885 found the Transcendent ahead of all other sorts in the State. There was probably a hundred times as many Transcendents grown in the State the past year as of any other variety. Each year some new variety is brought out as better than the Transcendent, but somehow these never find their way into market. At Glencoe, last fall, I saw the Transcendents brought into the market by the wagon load; there were also a very few bushels of Duchess, but very few of anything else. Now the farmers in that vicinity have undoubtedly paid out dollars for other varieties where they have cents for Transcendents. I look forward to the time when our markets shall be filled with choice apples and pears grown in our State, but until our experimental stations and professional horticulturists can show a better record than at present, would it not be good policy for every farmer in the State, who has not already got them, to plant out at least a dozen Transcendents. I know they sometimes blight, but, on the whole, they have proven the best of anything we have yet found. The fruit is not equal to the Wealthy or Autumn Strawberry, but they are, oh! so much better than nothing. I would not advise anybody to stop with the Transcendent for I have hopes of something better, but I would advise every planter to begin with Transcendents, and take care of them until they have something better. The extreme hardiness of the tree, the readiness with which it recovers from an injury, makes it a very desirable tree for the farmer to plant. The ready market and good prices found for the fruit in the towns of western Minnesota and Dakota, shows that there are many people living there who have an appetite for it.

Any surplus fruit will find a ready and profitable market for years to come. For canning it is very fine; dried it makes good pies or sauce; it also makes an excellent apple butter.

Still striving for something more excellent let us give a little more care and attention to this much abused and slighted fruit. It passed through the severe winter of 1884-5 almost unscathed; it can be profitably grown on any farm in the State, and every farmer ought to raise all that his family can use.

What a pity some of the farmers who have neither strawberries, raspberries, currants or grapes, could not have had the good sense to invest in Transcendents at twenty or twenty-five cents each, instead of Fameuse, Northern Spy and Maiden Blush, budded on "French crab stock, at only a dollar, apiece." There is no humbug about the Transcendent, therefore few farmers want to buy it, and few slick talkers are trying to sell it.

Mr. Smith announced that the next annual meeting of the State Forestry Association would be held at the State University commencing the third Tuesday in March, and invited the members of the Society to be present at the meeting, so far as possible.

HORTICULTURE ON THE STATE UNIVERSITY FARM.*

By PROF. EDWARD D. PORTER, Minneapolis.

Mr. President and Gentlemen of the Horticultural Society:

Before beginning my remarks upon the department of horticulture at the University Farm, perhaps it might not be out of place to give a short outline of the University in all its branches, and that necessitates a brief review of its organization and work.

The University of Minnesota, like every other institution that aspires to be a university in fact as well as in name, is made up of a group of colleges or separate institutions, each having a specified object, each distinct from the other, but all arranged under one general management, and collectively known as the University of Minnesota. In its ultimate design, it embraces the departments of literature, science, the arts, law, medicine, theology and agriculture. Our State is new, its institutions are all in a formative condition. It was impossible in this State to create at once an agricultural college fully equipped, law and medical colleges, and all the other departments of a complete university, and have them spring forth perfect and complete like Minerva from the head of Jove, but the development must necessarily be slow and gradual. The finances of the State of Minnesota, and the wants of the State did not warrant the establishment of all these different departments at once. The Board of Regents wisely began at the foundation, and organized the academic department, commencing with what might be termed a high school. This was the nucleus around which in time they hoped to build up as grand a university as any in the land. After this came the establishment of the classical department, then came the departments of literature and science, and these came along, one following the other so rapidly that in the course of five years the full organization of an ordinary college was obtained. This work was carried on step by step, keeping distinctly in view the ultimate organization of a complete university. At a very early stage in the organization of the university, it became necessary, in order to meet the demands of the farmers of the State, and in accordance with the provision of appropriating public lands for the organization of a college of agriculture and the mechanic arts, the act of congress, to organize the college of agriculture, but I may say that the organization of this college was in advance of public sentiment and demands. The people of the country did not require it, because they had not been educated to see the necessity of it, but its organization was forced, and like all hot-bed growths, the progress has been slower than it should be and would be, were the conditions more favorable. But the college of agriculture of the State of Minnesota was established as contemplated by the act of congress, and was organized by the Board of Regents as authorized by the legislature of the State.

This college of agriculture is made up of two departments, in reality; the theoretical and the practical. Agriculture, for its successful prosecution and in its scientific researches, makes demands upon every department of human knowledge. There is no trade, business or occupation followed by the human race that

*The address of Prof. Porter was delivered extemporaneously before the Society on Thursday afternoon, and appears at this place on account of a delay in returning the manuscript to the Secretary, after its revision.

requires as well disciplined, as well cultivated a mind, as the prosecution of agriculture. I know that is contrary to the generally received idea, that if there was a dull, stupid boy in the family, all he was good for was to make a farmer, but if there was a bright boy you must make him a lawyer. But I make the statement without fear of contradiction, that it requires ten-fold more brains and more education and more skill to make a successful farmer than it does to make a lawyer, physician, clergyman or merchant.

I don't know of a department of labor that demands more diversified information than agriculture. The farmer must not only have a thorough knowledge of the work in itself, he should also understand the underlying principles upon which his labor is based. There is not a single field of human knowledge from which agriculture does not demand a contribution.

Let us see in what respect this applies to the farmers of Minnesota. In the first place, for a successful prosecution of his business and calling, the farmer should be familiar with the soil; its cultivation is one of his labors, and it is utterly impossible for him to become acquainted with its characteristics, composition and requirements, its adaptability to one kind of fruit or another, to grains, vegetables or stock, without first becoming familiar with the principles of chemistry, mineralogy and geology.

Has the University of Minnesota made any provision for the student in these departments?—It has the finest geological museum in the northwest; its chemical laboratory is fully equipped with the most improved and complete apparatus, and is under the charge of a competent corps of professors. There is most ample provision for instruction in all these departments.

The intelligent farmer should possess a thorough knowledge of plants—their structure, both general and minute,—their habits, adaptability to varied soils, methods of germination, growth and fruiting, and their relative economic value. The science of botany is peculiarly necessary to the agriculturist, and in how far can the University supply this need? It has a laboratory wherein each student uses his own compound microscope, and with his eyes corroborates what he learns in his text books; he sees the cells of the plant, their arrangement into various tissues, their different uses in the several parts—leaf, stem and root. He examines also the fungus growths which prey on our field crops—becomes familiar with the methods of the potato fungus, the ergot of wheat and rye, the corn smut, etc. He is enabled thus to study and investigate the whole realm of plant life from the minute bacteria to the fruiting apple tree.

In other departments of science he obtains facts equally valuable and necessary, for the farmer must learn the laws of the elements that are continually at work, modifying and controlling the things with which he labors. He should familiarize himself with the effects of light and heat and electricity, of storms, ice and snow, of heat and cold, and in all these branches of learning the University offers him great advantages both as to excellent apparatus and skilled instructors. There are between twenty and thirty professors who are men devoted to their specialities, and they offer the amplest provision for the investigation of these necessary adjuncts to farming.

So much in general for the equipment of the University. Now as to what provision is made for the Department of Agriculture. The student who comes to the

University of Minnesota enters his name in the department he prefers. If he enters the school of agriculture he will go into the classes of physics, botany, chemistry, etc., with all the others, whether in the classical, scientific or his own department. All the students receive the same advantages. If the boy wants to study civil engineering he goes into the classes in mathematics with all the others. In this way economy in teaching is secured, the work being accomplished thus instead of having, for instance, as many professors in mathematics as there are departments. Of course one man can just as well instruct fifty students as five.

The specific work belonging to the Department of Agriculture is divided into two parts, the theoretical and the practical.

When I took charge of this department of the State University, and looked over the field, I found not only in Minnesota but in many other states of the union, the appliances were furnished, but the boys to avail themselves of the appliances were not there. Minnesota is not alone in this respect. Yale College that has an organization of over a hundred years, and has sent out its graduates all over the face of the earth, with its splendid equipment and provision for collegiate instruction, has graduated but six students in agriculture since 1864; but while the University of Minnesota has not a very large class of young men that have enrolled their names in the college of agriculture, among the 300 or more students in the university, over one-half come from the farm, and it is the farmers' sons and the farmers' daughters who are receiving the benefits of this institution.

Upon taking charge of the department of agriculture, I found one of the very first things necessary was to furnish the means for giving students a practical knowledge of agriculture in all its branches, and that is the work that has occupied my time and attention for the past four years. The methods of instruction in all departments have materially changed within the past half century. For instance, in the department of chemistry, look what a wonderful change has been wrought in every detail. I can remember hearing my father say that all the chemistry he got in his college course was from a few pages in the back part of the old treatises on natural philosophy; he never saw a single quart of oxygen or hydrogen made. After studying chemistry in that way, a student knew nothing about it; even when I had my first lessons in that science I remember very little of it except sitting thirty feet away from the laboratory table, and seeing the professor perform these experiments. That is all we got of chemistry twenty-five or thirty years ago. Now, the student enters the laboratory, performs all these experiments with the elements, and then compounds, etc., and becomes thoroughly familiar with every detail of the laboratory. Now, there isn't a well organized institution in the United States that pretends to teach chemistry in any other way. At the University practical chemistry is taught in this manner. Every student is obliged to take up the analysis of compounds, and thoroughly familiarize himself with every element and with all the details of every experiment, so that when he has got through he knows something about it. That is the mode of teaching chemistry to-day. It is educating the mind and educating the hand and developing his powers of observation, and calling out his judgment; it is educating, it isn't stuffing. The same method is adopted in the department of engineering.

The science of engineering is taught by familiarizing the student with the workshop and the field. He selects his materials, puts up the structure, runs his line of

railroad, and makes his computations of elevation, embankment, masonry and superstructure, as though in actual construction, so that when he leaves the school he is prepared to enter upon the practice of his profession.

Our object is to make this farm the work-shop of the College of Agriculture, and to give a practical illustration of the subjects taught in the class-room, such as the student of chemistry may get in the laboratory, so that when we talk about soils and the adaptability of certain crops to particular soils, the student comes out there and sees a practical illustration under his own eye. He has read about clay and sand and loam, and his season's work on the farm with their soils makes him practically familiar with their properties. This method of reaching these practical results is going to be of great service to the agriculture of this State; but we haven't the number of students that the State should send us; we are ready to furnish the instruction and the appliances if you will only furnish the boys.

On the first day of May we expect the students in our department to come out to the farm, and we will give them good, comfortable quarters, plenty to eat and plenty to drink, and a plenty to do. At five o'clock the bell will ring for them to get up, dress, feed the stock, clean the stables, harness the horses and milk the cows; at half-past six breakfast is ready; at seven every man and every team is ready for the field. There are no books except for reference and recreation. The text-books have all been left down at the University.

The student wants his dinner, I claim, about twelve o'clock; it will take him fifteen minutes to get into the house, take off his soiled overalls, put on something else and get ready for dinner; the dinner bell will ring at a quarter after twelve, and the boy will go to work at one o'clock. We stop work in the summer at six; have supper a quarter past six. That has been our custom for two years past. On the first day of October his work ceases at the farm. After that date we do not expect him to do any more work in the field that year. The young man lays down the shovel and the hoe and takes off his cowhide boots and puts on his dress suit, and he goes into the class-room of the university. He is now a theoretical student. There he will have access to the laboratory, the work-shop and foundry, the museum and libraries, and receive instruction from a corps of instructors who will endeavor to do their duty and give him all the theoretical knowledge that is possible, and in the spring he will be ready to go back and take a dose of the practical again.

How are we going to train students in practical horticulture? Well, when the students come to the farm I propose to place one band in the horticultural work, and I expect to familiarize them with all the details of planting, care and cultivation that can be given in the line of horticulture; others will learn how to clean the stables, how to feed the horses, put the harness on, and know when the horse is harnessed rightly, and taught the use and care of farm implements and farm machinery. Another set of these boys will be detailed to stock farming; they will milk the cows, take care of the milk, clean the animals and take care of the stables and be made acquainted with the breeding and rearing of all kinds of domestic animals. In that way each one will be familiarized with all the details of every department of farm work; they will be changed off from one kind of work to another so that in the course of the season the young man will have a thorough drilling under the best instructed in all departments.

We expect to grow on that farm every variety of fruit and flower and grain and

grass, that can be grown in the soil and climate of Minnesota, and all the breeds of domestic animals of value to our State. That is what we expect to do. In many lines of work we have already made a beginning. I suppose you remember the fine exhibit Minnesota made at New Orleans, at the World's Exposition.

I may state that nineteen-twentieths of that agricultural exhibit was raised on the experimental farm, and every single article that was put on exhibition at the last State fair under my charge was raised on that farm, and its exhibit there of grain, grasses and vegetables I can duplicate fifty times to-day by going to the stacks and bins and taking it out; so that we congratulate ourselves that we are doing some work in that line.

Now you ask what are we doing for Horticulture on the Experimental Farm? We have made a beginning.

Our vineyard is planted on a hillside with an eastern exposure. It contains the following varieties:

Agawam, Brighton, Concord, Delaware, Empire State, Goethe, Hartford Prolific, Iona, Ives Seedling, Janesville, Lady, Lindley, Martha, Merrimac, Moore's Early, Niagara, Pocklington, Prentiss, Salem, Wilder, Worden. Of these the Niagara and Empire State were planted last year. The Niagara made splendid canes. Of the Empire State but six lived of the ten set. Excepting the Concord, there were but ten vines planted of each variety, the object being to test their relative merits, under identical conditions of exposure, soil, culture and pruning. All have grown well but Iona—which has been discarded. A little fruit has been borne the past season, but next year will bring, I hope, a good crop.

With apples a fair start has been made. I have been in correspondence with Prof. Budd ever since his return from Russia and learned from him the best results of his work. You know that the object of Prof. Budd and Mr. Gibb in going to Russia was not alone to secure new varieties. Their primary motive was to correct the nomenclature of the Washington importations—these had been received from many sources and had been duplicated under different names; the whole list was in confusion, and the visit of these distinguished horticulturists has resulted in a thorough revision and correction of that tangled work.

Their visit was of great value also in determining the behavior of these trees in their own home; not among the least of its results, let us hope, was the additional varieties they discovered and imported.

Besides fifty-eight varieties, one, and small two-year old trees, I secured from Professor Budd almost an entire duplicate of his extensive collection of Russian apples, numbering about two hundred and twenty-five varieties. These latter were grafts made late in March, from cions that were cut from the trees at the time the grafts were made. That is to say, we found in Prof. Budd's collection about 225 varieties that, after the severe winter of 1884-5, and after being grafted so late as the last days of March, were yet of such vitality that but one variety in the whole list was lost—and of that variety but three grafts were secured. This we regarded as a remarkable indication of hardiness. From three to one hundred grafts were obtained of each variety—averaging not more than twenty of a kind. These were planted in a sheltered situation and given thorough cultivation till about the middle of July, after which they received no cultivation save an occasional "scalping" of winds.

For the experimental orchard, however, I chose the most open situation and what I regard as the most difficult place for tree growth on the farm. It is our intention to test these varieties thoroughly, and I feel confident that the trees that survive five winters in our exposed experimental orchard, can be relied upon for all Minnesota points of equal latitude. For comparison of hardiness, I planted two rows of Duchess in the same orchard. All received moderate cultivation, the twenty-four feet space being planted with potatoes, and only two trees of the two hundred planted died; the others made a good growth. You will doubtless remember, however, that the latter part of the summer was excellent growing weather, so that, despite lack of cultivation at that time, the trees continued to grow, instead of preparing for winter, hence many of them went into winter quarters with soft shoots, and these will probably suffer. As rapidly as any trees in the orchard die, their places will be filled with other varieties from the nursery, and thus I hope soon to thin out the weaklings and present to you a list of the fittest, which will survive.

The orchard is planted twenty-four feet each way; such of the Russians as they continue to grow shall have ample room to reach their full development.

I also received from Prof. Budd nine varieties of Russian pears, all of which were set in orchard, part in the experimental orchard, and the others in the more sheltered fruiting orchard, which consists of well known varieties of plums, apples and crabs, planted on a northeast slope, in new timber soil.

There are also on the farm a number of young conifers and deciduous timber trees. Seedlings secured from Robt. Douglas & Co., of Illinois last spring. These have in the main, done well. On account of the great press of work the young evergreens, from two to four inches high, were merely mulched with straw, instead of being shaded. The result almost justified a continuation of the plan. White pine, white and Norway spruce and balsam fir did as well as with shade, but red pine (*P. resinosa*) and Austrian pine were almost complete failures.

In small fruits, we have a good beginning in raspberries and about a dozen varieties of the strawberry.

In all our work with trees and fruits great care is taken to keep the varieties properly labeled; this becomes of supreme importance, and requires vigilance where the number or sorts is so great, and the number of trees so few as they are at present. I have a firm hope that in the long list already secured, to which additions will be made every year, something absolutely hardy will be found. If a single sort of the entire number should prove good in fruit, late in season and hardier than our hardiest, it will more than repay all outlay and expense, though all the rest prove failures.

In addition to the above lines of work with fruit, we have grown during the past season for illustration and experiment, every variety of garden vegetable adapted to the soil and climate of Minnesota, embracing varieties of potatoes, corn, beans, peas, celery, cabbage, cauliflower, carrot, cucumber, lettuce, melons, okra, onions, parsley, parsnips, salsify, spinach, etc., etc.

Besides this work in horticulture, we have carried on all the operations of general farming and have made a commencement with stock, and the dairy. We have fine representations of Short Horns, Holsteins and Jerseys in cattle, Berkshires, Poland Chinas and Durocs in swine, Shropshire Downs in sheep, and expect to add to these breeds as soon as funds are available for this purpose.

But not to detain you longer I here extend a most cordial invitation to the Horticultural Society to hold its next Summer Meeting at the Experimental Farm, when the members and their friends can have an opportunity of seeing for themselves what we are doing for the farmers and horticulturists of Minnesota.

*LIST OF FRUITS

GROWING ON THE UNIVERSITY EXPERIMENTAL FARM, SEASON OF 1885.

HILLSIDE ORCHARD.

APPLES, Native.

- | | | |
|---------------------|----------------------|-----------------|
| 10. Whitney No. 20, | 10. Orange Crab, | 10. Strawberry, |
| 39. Wealthy, | 10. Beechs Sweet, | 10. Minnesota, |
| 39. Duchess, | 5. Perce's Seedling, | 5. Giant Swaar. |
| 10. Tetofsky, | 5. Rollins Pippin, | 5. Ponas. |

APPLES, RUSSIAN, Selected list.

- | | |
|------------------------------|-----------------------------------|
| Aport, Orient. | 187. Glass Green. |
| Early Sweet—Vor. | 200. Renz Little Turnip apple. |
| Arkaa—203—W. | 232. Haw Pipka. |
| Antounooka—236 W.—26. M. | 277. Warsaw. |
| Borovinka. | 282. Woronech's. |
| Sobrin Kosteiana. | 284. Kremer's Glassy. |
| English Pippin. | 286. Kremer's Seedling. |
| Genchevka. | 316. Red Queen. |
| Green Sugar. | 361. |
| Large Borsdorfer. | 365. Ananasnu. |
| Plodovitka. | 206. Czars Thorn. |
| Rubets Native. | 252. Aport—O'Porto Apple—23. M. |
| Serinka-Riga. | 262. Charlamoff. |
| Yellow Transparent. | 375. |
| 3. M—277. Lead apple. | 382. Russian Green Apple. |
| 18. M. Anisomooka. | 402. Borsdorf. |
| 4. M. Slikleanka. | 407. Blackwood—53. M. |
| 20. M. 447, Reinette Kuiski. | 410. Little Seedling. |
| 22. M. Colville Krasnui. | 413. Cross Apple—15. M. |
| 5. Oriel. | 442. Yellow Calville. |
| 56. Vor. | 447. Queen of Kiew. |
| 21. Vor. | 457. Klineff's Apple. |
| 257. Arabskoe Vor. | 469. Grandmother's Apple—6. M. |
| 105. Russian Gravenstein. | 477. Christ's Birth Apple—161. M. |
| 121. | 508. |
| 169. Green Sweeting. | 599. Romenskoi—Omensk—11. M. |
| 177. Green Streaked. | 984. Anis Kurski. |
| 185. Anisette Anisowka. | 934. 1,277. |

*The list of trees, etc., reported at the summer meeting as having been set at the State Experimental Farm, is included in the list herewith presented.

RUSSIAN PEARS.

16 Oriel; 17, Vor. (on *Pirus Arii*); 102, Vor; 702, Vor; 27, Riga; 342, 347, 358, 391, 396, 439.

Of the Russian varieties we have about 2,500 root-grafts growing, of twenty-two of the most promising.

RUSSIAN PLUMS.

PLUMS.

- 1 Russian.
- 6 Rollingstone.
- 10 De Soto.
- 10 Forest Garden.
- 10 Weaver.

RASPBERRIES.

- Turner.
- Cuthbert.
- Superb.
- Gregg.
- Golden Cup.
- Doolittle Blackcap.

CURRANTS.

- Fay's Prolific.
- Stewart's Seedling.
- Red Dutch.

- White Dutch.
- White Grape.
- Black Naples.

GOOSEBERRIES.

- Houghton's American Seedling.

- Chas. Downing.

GRAPES.

- Concord.
- Niagara.
- Janesville.
- Delaware.
- Pocklington.
- Prentiss.
- Lady.
- Martha.
- Moore's Early.
- Empire State.

- Brighton.
- Ives Seedling.
- Goethe.
- Hartford Prolific.
- Salem, Rogers 53 or 22.
- Worden.
- Wilder, Rogers No. 4.
- Merrimac, Rogers No. 19.
- Lindley, Rogers No. 9.
- Agawam, Rogers No. 15.
- Iona.

BLACKBERRIES.

- Snyder.

RUSSIAN MULBERRY.

STRAWBERRIES.

- Crescent.
- Countess.
- Chas. Downing.
- Capt. Jack.
- Glendale.
- Iron Clad.
- James Vick.

- Jersey Queen.
- Manchester.
- Minnetonka Chief.
- Green Prolific.
- Wilson.
- Windsor Chief.
- Rays Prolific.

RECAPITULATION.

Apples, 67 varieties: Pears, 11; Plums, 5; Currants, 6; Gooseberries, 2; Grapes, 21; Raspberries, 6; Blackberries, 1; Strawberries, 14; Mulberry, 1. Total 133 varieties.

LIST OF STOCK

GROWING IN THE NURSERY OF THE EXPERIMENTAL FARM OF THE UNIVERSITY OF MINNESOTA, PLANTED IN SPRING 1885.

2500 Root Grafted Russian apples.	500 European Larch.
560 Potted Grape Vines.	100 American Larch.
2000 White Willow.	30 Catalpa Speciosa.
500 White Pine.	100 European Mountain Ash.
500 Austrian Pine.	500 White Ash.
500 Scotch Pine.	500 Green Ash.
500 Red Pine.	100 Black Walnuts.
500 Mountain Pine.	100 Wild Cherry.
500 White Spruce.	1000 Box Elder.
500 Norway Spruce.	200 Norway Maple.
24 Colorado, or Blue Spruce.	10 Salix Napolemis.
500 Balsam Fir.	10 Salix Argentea.
10 Abies Concolan.	10 No. 123, Russian Willow.
200 Hemlock Spina.	10 No. 31, Russia Willow-Riza.
24 Douglas Spina.	10 Russian Poplar.
500 American Arbor Vitæ.	500 Russian Mulberry.

RECAPITULATION.

Artichokes, 1 variety; Asparagus, 1; Beans, 24; Beats, 14; Brusseles Sprouts, 1; Brocoli, 3; Cabbage, 7; Carrots, 8; Cauliflower, 2; Celery, 6; Corn, 26; Cucumbers, 9; Kohl Ra'bi, 2; Lettuce, 7; Melons, 22; Nastertium, 2; Okra, 3; Onions, 14; Parsley, 2; Parsnips, 4; Peas, 22; Potatoes, 362; Radishes, 7; Rhubarb, 2; Salsify, 1; Spinach, 4; Squash, 8; Tomato, 5; Turnips, 6; Rutabagas; Herbs, 12. Total, 593 varieties.*

FINAL RESOLUTIONS.

Mr. Harris, from the committee on Final Resolutions, presented the following report.

The committee on Final Resolutions would respectfully report: That the thanks of the Minnesota State Horticultural Society are due and are hereby tendered to the citizens of Minneapolis, for the generous offer of hospitality and the liberal entertainment they have given us at their homes and at the Nicollet House, thereby making our sojourn in their beautiful city both pleasant and agreeable. To the various railroads leading to this city for rebates from their regular fare, to delegates and members in attendance. To the editors of the daily papers of Minneapolis and St. Paul for the many cheering words they have spoken for this Society in the past, and to the gentlemanly representatives of the Press who have honored this meeting with their presence and so ably and correctly reported the same. Also to our retiring President Truman M. Smith, Secretary S. D. Hillman, and the Executive Committee for the prudent and economical manner in which they have managed the financial and other affairs of the Society during the past year.

*NOTE.—For lack of space the complete list, *in extenso*, of vegetables and cereals is omitted here.

Also to the delegates in attendance from State Societies of Iowa and Wisconsin for the assistance and encouragement they have so ably rendered us at the present meeting.

J. S. HARRIS,
A. W. SIAS,
G. W. FULLER,

Committee.

Mr. Pearce moved a vote of thanks to the proprietors of the Inglewood Springs for supplying the Society during its session with pure and healthful spring water, which motion was adopted.

IN MEMORIAM.

REPORT OF THE OBITUARY COMMITTEE.

To the Horticultural Society of the State of Minnesota:

MR. PRESIDENT AND GENTLEMEN:—Your committee have to report with much sorrow and regret, the death during the past year of D. W. Humphrey, of Faribault, one of our most respected, honored and useful members, and a man of great merit and worth. Honest and faithful in every walk of life, lending a willing, helping hand in the cause of humanity, he was universally respected by a wide and extended acquaintance.

Mr. Humphrey was a son of the late Dr. Levi Humphrey, and was born April 23, 1826, in the town of Southwick, Mass. He came to Minnesota as early as 1855. In the spring of 1857 he was married to a most estimable lady, in Suffield, Conn., and his married life was a happy and eventful one. Mr. Humphrey contributed much during his lifetime to all that would elevate and better the condition of mankind. He was an earnest and efficient worker in all that appertained to horticulture. A member of a Christian church, his sympathies extended to all classes of people. He was anxious for the welfare of all. We feel that not only this Society, but the State at large has met with a great loss in his death.

Your committee in conclusion would report the following resolutions for your consideration:

Resolved. That the State Horticultural Society of Minnesota learn with much regret the death of D. W. Humphrey, late of Faribault, in this State, which sad event occurred at his residence in that city on the 13th of October last.

Resolved. That this Society extends to the widow and family of our late associate our most heartfelt sympathies in their sorrow and affliction.

COL. J. H. STEVENS,
A. W. SIAS,
S. D. HILLMAN,

Committee.

The resolutions were adopted and ordered placed on file.

DELEGATES TO WISCONSIN.

On motion of Mr. Harris, Truman M. Smith was appointed a delegate to the meeting of the Wisconsin Horticultural Society, at Madison, commencing Feb. 2, 1886.

On motion of Secretary Hillman, J. S. Harris was also named as a delegate to that meeting.

President Smith. I wish to express my thanks to the Society for this mark of confidence; and, before we adjourn, I feel that I would

like the indulgence of the Society for a moment to say a word as to the future status of the Minnesota State Horticultural Society. Prof. Porter's remarks very forcibly called to my mind some facts which some of the members present may know to be true. When he was describing the advantages and resources of our State agricultural college at the university and university farm, and the chances for boys to learn, the paraphernalia for studying the whole thing out, it called to mind the time when I was first appointed by this Society to visit the State University, and to make a report upon their proceedings there. Gentlemen, you would be astonished when I tell you the facts. I went there some thirteen or fourteen years ago. The professor was instructing a class in botany by lines drawn upon the blackboard; Col. D. A. Robertson was the professor. He called upon me for a little speech. I told them I didn't know how to commence; I found myself in a very awkward dilemma; I felt that I was about the only green thing about the institution. I felt that I might make a very proper "subject" for the study of botany. [Laughter] Look at the contrast to-day; observe the change in our society! And who has helped to bring about some of the marked changes and has stood shoulder to shoulder with his part of the work to keep alive the interest and advance the progress of the Society? Wyman Elliot of Minneapolis, the one whom you have chosen to act as your President for the coming year. I feel that with his energy, his perseverance, his knowledge of horticulture, as your President, with the help of able assistants, he will be enabled to accomplish much for the cause of horticulture. But, gentleman, if you expect him to take this Society upon his shoulders and carry it alone you will be disappointed. Let every member give him that aid and encouragement that he has always given to the State Horticultural Society and then you will make a grand success of your efforts in the future.

Mr. Gould. Before President Smith leaves the chair I want to move a vote of thanks to our late President for his earnest efforts and the faithful and able manner in which he has discharged the duties of the position.

The motion was adopted.

Mr. Harris. I wish to endorse what President Smith has said in behalf of Wyman Elliot, for I believe he has not exaggerated his work for the Society, in the least. And if I have been enabled to do anything for the Society in the past it has been very largely due to the assistance he has given me.

President Smith. I wish to say further that during the time I have had the pleasure of being your presiding officer I have not been able to serve you so faithfully as I could wish. What little land I occupy has been taxed to an enormous extent by the city and Board of Public Works. To illustrate, from five acres I have been working and using as my means of support I have had to pay twelve hundred dollars of taxes for city assessments, etc., consequently I have not given the time to the Society that I otherwise might have done. This is my only excuse. My heart has been with the Minnesota State Horticultural Society; I have been ready and willing so far as my means and health would permit to work for its success.

Secretary Hillman said that he desired, before the final adjournment of the meeting, to say a word by way of acknowledgement for the mark of favor and confidence on the part of the Society, in re-electing him to the position of Secretary, which was all the more gratifying to him, being done while he was necessarily in attendance, at Winona, as a witness in an important railway suit. He hoped in the future as in the past to receive the cordial support and encouragement of the members of the Society in the discharge of the duties of the responsible position, and promised to cheerfully work for the advancement of the interests of the Society, so far as he might be able so to do.

Mr. Kellogg. On behalf of the delegates from the Wisconsin State Horticultural Society, I wish to say that we have been received most kindly, and most generously entertained, for which we desire to return our sincere thanks. We are very glad that you have appointed to-day two of your number to attend our next annual meeting at Madison. I tell you it takes the hair right off up here—these winter breezes—and that's what makes you so smart. [Laughter.] Sometimes it is said that it is the women that take the hair from some men's heads. I never had my cheeks frozen until this morning; the hair hasn't come off yet, but I don't know but it will. In such a country it takes men that can get up in the morning and "get," to raise fruit; down our way we can raise apples on dead trees. [Laughter.] I can show you a specimen of that kind. We shall have a one-horse affair at Madison; we don't expect to do as well as you. We meet with the State Agricultural Society, and this year our joint convention terminates with a two days' session of horticulture. But we will give you a most cordial welcome and reception.

Mr. Harris moved that the salaries of officers be fixed for the ensuing year the same as last, to-wit: of the President, \$25; of the Secretary,

\$400; of the Treasurer, \$25, and of the Librarian, \$10. The motion was adopted.

Mr. Ditus Day was requested to state how the fair in Rice county was held successfully without horse-racing.

Mr. Day said he would ask Mr. Harris, who was present at the fair, to give the information asked for.

Mr. Harris. I can only say, Mr. President, that I attended the fair at Farmington and I think it was the best county fair I ever attended. The exhibits were first-class, the attendance good and everything went off pleasant and cheerful. Nobody got tired of it. One of the causes of their being able to keep the people there was that they provided for their entertainment. They had several speakers there who gave short addresses. Gov. Hubbard presided and while the fair was going on instead of being disturbed with horse-racing the people had an opportunity to get some instruction. There is no reason why similar fairs may not be made a success all over the State. No premiums were offered for racing, and everybody knew there would be no prizes for fast horses. The result was that the premiums awarded for vegetables, etc., were promptly paid. Exhibitors brought their products in large quantities and went home with their money in their pockets.

President Smith. The great state of New York holds her fairs without any horse-racing or any premiums on fast horses and has followed that plan for several years, and with as much success I think as any state in the Union.

Mr. Day. I may state that while they got their premiums on the vegetables last year it has not been the case when we had horse-racing.

REMARKS OF S. M. OWEN.

Mr. S. M. Owen, editor of *Farm, Stock and Home*, being present was called upon to address the Society and came forward and said:

Mr. Owen. Mr. President, if this was a base ball match I would call "foul." I don't know what I have done that I should be submitted to an ordeal of this kind, simply because I happen to be connected with an agricultural, and to a certain extent, at least, a horticultural paper. I don't know what good I can do you, unless it is to let the light of my countenance shine upon you for a few moments. I am quite sure I can give you no lessons in practical horticulture that will do you any good, or add to the sum of your usefulness or morality. It has been a good many years since I did anything in practical horti-

culture, raising horticultural products of any kind, and then my most successful efforts were when the owner wasn't looking. [Laughter.]

I have heard a good deal of discussion here about the "hardiness" of fruit, especially apples. I remember in my youth I used to be pelted by apples that were "hard" enough to satisfy me, and ought to satisfy the ambition of a Minnesota winter. [Laughter.] I think I could suggest to you some improvement in raising water-melons, for instance; I remember when I used to aid in raising a big crop in a small portion of a single evening—vines and all. [Renewed laughter.]

I have been a silent listener to your discussions during the sessions of this meeting; I hoped I would be allowed to remain a listener. This convention has suggested the thought to me that our civilization commenced at the wrong end. It seems that we are just arriving at a point where we should have commenced a thousand years ago. Civilization and science began by studying the heavens, measuring and analyzing the stars, and even trying to penetrate the mysteries of the future, hundreds of years before they began to study the wonders and capabilities of the despised clods at our feet. You gentleman are beginning to do that. You are beginning to learn the basis of the earth we live upon. In fact, the philosophers, the logicians, the moralists, the artists and the poets that are doing the world the most good to-day are found in the ranks of just such men as yourselves. This is not "taffy," gentlemen, and no boquets are expected. Even now, if you gentleman here were long-haired, hollow-cheeked and dispeptic, and were discussing abstruse questions about the "thinness of the whereas"; or if a man is unable to contain himself; is he too large or too small?—or some other philosophical subject, this hall would be full of people, sitting and listening to your "great wisdom." But you are here discussing questions of vital importance and practical value, and yet you are hardly deemed worthy of an audience of a single person, aside from those who are interested in your work.

For ages past much that has passed for genius of the noblest kind has been employed in painting mythological gods and saints, trying to discover something of the unknown world, or speculating on questions of no practical value; but you, gentlemen, are the logicians of the hardy tree; you are the philosophers of an apple that will stand the winters of Minnesota; you are the moralists of the beautiful and the good—the good to the taste and the beautiful to the eye—you are the poets of the flower and the fruit; as such I address you, and regarding you as such I cannot trespass on your time longer. I bid you good evening. [Applause.]

THE NEXT ANNUAL MEETING.

On motion of Mr. Harris the place of holding the next annual meeting was fixed at the State Capitol, St. Paul, commencing the third Tuesday in January next.

Prof. Porter. Mr. President, I would like at this stage of the proceedings of this meeting to call up a matter for a little consultation and action, if possible. It is well known that the State Amber Cane Association is a child of the State Horticultural Society; that a few years ago they were in the same house and fed at the same table, but in the course of time with increasing growth the boy felt himself a little bigger than the "dady" and he wanted to set up for himself. This Society kept it, as it were, in lead strings for awhile and extended its fostering care. But the Amber cane industry for two or three years past, owing to circumstances entirely beyond control, the existing low prices of syrups, unfavorable seasons, etc., has had a damper thrown over it and we have not been able, out of a membership of some 250, perhaps, to secure the attendance at our meetings that we ought to have. I find in looking over our list of membership that nearly all our members are also members of the Horticultural Society. They want to attend both meetings, but do not feel like taking a second week to go to both meetings. It is impossible to carry on the operations of these two societies at the same time. What I would suggest is that we might get a day out of the week that the State Horticultural Society meets for our meeting, and, if necessary, have a meeting of five days' session for both societies. Or, I would suggest that time might be saved by accepting papers presented by their titles and placing them on file for publication. As papers are read here they do not do a tenth of the good that one gets from sitting down and carefully reading them at his leisure. Nearly two-thirds of the time of this meeting has been taken up with the reading and listening to these papers, although I will say in this connection that of the six meetings of this Society which I have had the pleasure of attending that I consider this by far the best of the six—and I consider the papers that have been presented here by far the ablest papers we have ever had presented before any meeting of the State Horticultural Society.

President Smith. A four or five days' meeting is the most that we could get. It seems to me it might be arranged if the Amber Cane Association could get through with its work in half a day.

Prof. Porter. I think it would be better if we could get a day. We hardly get warmed up in half a day.

Mr. Elliot. I have been thinking of the matter somewhat, that perhaps we might "sandwich" in the Amber Cane meeting by taking half a day for the Amber Cane Association, with perhaps an evening session. Some of their work could be done by having committees appointed to arrange their work, and our committees could do the same way.

Mr. Smith moved that the Society hold a five days' session instead of four.

Mr. Barrett. Allow me a suggestion. I come about three hundred miles on the Manitoba road and I could not attend the entire session. But I speak only for that part of the State.

Mr. Ditus Day moved to amend the motion by leaving the matter under consideration with the executive committees of the two societies, the motion was adopted.

Mr. Elliot. Mr. President and fellow members: For the honor you have conferred upon me in electing me as your President for the ensuing year I would return my grateful thanks. I do not know whether I shall be able to conduct your meetings as ably, present and dispatch the business of the Society as readily as Brother Smith has done, but if you will give me your assistance I will try to assist the members of the Society in carrying on the work successfully. When I came to this State I was a mere boy. I have grown up here in Minnesota and have devoted a portion of my time to horticulture. It has always been my pride to assist whenever I could in that direction. I feel grateful for this honor which you have conferred upon me and shall try to do the best I can to serve you. The standing committees will be appointed and announced hereafter.

On motion the meeting then adjourned *sine die*.

SECRETARY'S PORTFOLIO.

DEFERRED PAPERS, REPORTS, NOTES, EXTRACTS, ETC.

INTRODUCTORY NOTE BY THE SECRETARY.

The space which necessarily has been given to the routine report of the Society's transactions, to the discussions had at its annual meetings, and to the publication of all the varied information there presented, has greatly limited the number of the pages which otherwise would be available for the insertion of editorial clippings, extracts and certain items of more or less importance, which very naturally and properly, perhaps, should find a place in this department of the work.

We here would call attention to the numerous papers read, and to the interesting reports presented, concerning horticultural work, as set forth in foregoing pages. We do not doubt the officers and members of the Society will feel both pride and satisfaction at the interest taken upon the part of those who have so generously contributed, and thus have shown their willingness to aid in the advancement of the worthy cause of the Society. Those who peruse the pages thus devoted to the various subjects treated, will find we trust some indications of the zeal and the progressive spirit that animates the earnest workers in our ranks in this and other states.

The topics treated may embrace a wider scope, or range, perhaps, than usual; but still, we think, not more than circumstances fully justify. The quite phenomenal experience of horticulturists within the year, has surely called for sober thought, and has made necessary deep investigation, to find if possible the cause of certain changes which have taken place, in order to elicit information with regard to best and wisest means and methods to be used, to profit by the many lessons learned.

One pleasing feature which we may refer to here—as characteristic of the present volume—is the elucidation of such newer facts and

figures, theories and plans, as have been found of value, gained by most recent observations, experiments and actual tests, that have been made by those who take an active interest in the cause of horticultural work and experimentation. Discussion has been had of timely topics. Results to be thereby obtained, and the conditions of success, are outlined here in language clear and plain. This setting forth of proper methods to be used is certainly to be commended.

Fruit growers seem determined to pursue their work in spite of dire disasters of the past, until some means may be obtained whereby the noxious insects, fruit diseases and such climatic influences, as heretofore have proven so destructive, may be, perchance, quite overcome.

No doubt much interest will be felt upon the part of some regarding certain novel theories which are herein advanced. If real progress is thereby promoted the object had in view will be, we trust, subserved; for it should be the constant aim to obviate the difficulties in the way of that success which is alone attainable by persevering effort and by patient toil. To winnow out the chaff and treasure up the golden grain should be the object sought by all.

MEETING OF THE EXECUTIVE COMMITTEE.

A meeting of the Executive Committee was held at St. Paul, March 11, 1886.

There were present at the meeting of the Executive Committee, President Elliott, Treasurer Grimes and Messrs. Harris, Pearce and Smith of the Executive Committee. In the absence of committeeman Underwood, S. M. Emery, of Lake City, was elected as member of the Executive Committee, pro tem.

By vote, S. M. Emery was elected secretary of the meeting.

The expenses of Truman M. Smith, \$18.15 and of J. S. Harris, \$8.50, delegates to the winter meeting of the Wisconsin Horticultural Society, were allowed.

It was decided to request the consolidation of the divisions G, H, and I, of the premium list of the State Agricultural Society, the same to be under the management of the Horticultural Society and to request the Agricultural Society to appropriate the sum of \$2,000 for premiums, to disburse for the three divisions. Division "G" relates to fruits and flowers; division "H" to vegetables, and division "I" to sugar, syrup, and honey, bread and domestic pantry stores.

REPORT OF DELEGATES TO WISCONSIN.

To the Secretary of the Minnesota State Horticultural Society :

The undersigned would respectfully report that we accepted the appointment as delegates to attend the annual meetings of the Wisconsin State Horticultural and Agricultural Societies, held at Madison, Feb. 1, to 5th, 1886, and availed ourselves of the privileges afforded by attending the same.

The meetings of both societies were held in rooms of the capitol building, were well attended by representative men from different sections of the state and conducted in a manner that was both interesting and profitable to all who were so fortunate as to be present. We being horticulturists, of course the horticultural meeting received the most of our attention.

The program of the first day, made the business for Monday evening miscellaneous and informal, and the time was largely taken up in greeting the members as they arrived, unpacking and arranging articles for exhibition.

The business of Tuesday was opened with the report of the Secretary, in which he spoke of the advisability of establishing horticultural experimental stations for the purpose of originating new varieties of fruits adapted to general cultivation in the state, getting thorough tests of their value and hardiness under different conditions before recommending them for extensive planting, and also for conducting investigation of the various insects and fungoid enemies that are becoming so damaging to orchards and gardens, to ascertain more practical remedies, these stations to be under the supervision of competent men selected by the society.

Following this came reports from the members of the committee of observation. The general tenor of these reports was that the winter of 1884-5 was most damaging to orchard and nursery trees, including most of those varieties that had been called iron-clad, that was ever experienced in Wisconsin. Mr. J. C. Plum, of Milton, read an elaborate paper favoring the division of the state into fruit districts, the division lines to conform to the peculiar geological and climatic characteristics pertaining to the various sections of the state. He also advocated the issuing of fruit lists showing the most suitable kinds for growing in the several districts. The matter of dividing a state into districts, mapping them out and recording in each section, the character of the soil and formations with relative advantages they possess, the proximity to bodies of water or timber, and elevation, is a good one as it

enables the horticultural society to do particular work for each district without neglecting the best interests of others, and as soon as practical a committee should be appointed to make a careful survey of our State and arrange it into suitable districts. The question of experimental stations was discussed at considerable length and favored by all the members present, and resulted in the adoption of a resolution requiring the president to appoint a committee to take action looking to the establishment of such stations.

The annual address of President J. M. Smith was an interesting document in which he, in his free and lucid manner, spoke of the grand display of orchard fruits made by the society at the New Orleans Exposition last winter, and the joyous feelings of the horticulturists over their successful competition with the states of the northwest, which made them "proud of their state and hopeful that a new and prosperous era was dawning upon those engaged in horticultural pursuits." When spring opened the joy was turned to sorrow by the great disaster that had befallen their state and the whole northwest, the complaint of dead and dying trees was almost universal, and the question is everywhere asked "What shall we do?" "We want something better" He said, All are anxious and hope that we have something better in store for us; that we are upon the dawn of a better day. I cannot but believe that between the many varieties of new Russians and new seedlings we shall find at least a few varieties that will endure our most severe winters with impunity, yet the experience of many years bids us be careful what we recommend." He further said, "You are doubtless aware that tree peddlers are already selling so-called Russians in all directions. Would it not be well to insert in our fruit lists a word of warning or some resolution in this respect that might be of benefit to those who will look with unusual interest for our next volume of transactions? While many of us firmly believe and all of us hope that we have some valuable varieties as well as perfectly hardy ones, none of us expect them all to be of permanent lasting value." He also spoke a good word for the Manchesteor strawberry, which will carry with it great weight as he is a strawberry grower of large experience and in whom the people have confidence.

Before the adjournment of this session Professor T. J. Burrell of Champaigne University, Ill., was introduced to the audience and gave a very interesting talk on "bacteria and fungoids." He is a pleasant speaker and is considered as the best known authority on "bacteria." He has spent much time in conducting microscopic investigating of

the blight that has of late years proved so destructive to western orchards and proves that it is a living organism of very low type, that it is capable of reproducing and multiplying itself ad infinitum where surroundings are favorable, and showed very plainly how it worked in the organism of the growing plant, and stated that no perfect preventive had yet been discovered. He also gave an able address on the apple tree before the Agricultural convention with blackboard illustrations showing the circulation of the sap, how cells and tissue are formed and the additional layers of wood are made—and explained the probable cause of winter-killing. He attributes much of the injury to summer's drouth and seemed to favor moist locations for orchard sites.

The evening session of this day was passed over in order to allow the members to be present at the opening of the agricultural convention in the assembly chamber and to listen to the annual address of President A. A. Arnold. His address was earnest, pointed and practical; he spoke like a man that was proud of his state and his calling, and congratulated the societies taking part in this convention, in the grand work of education that was going on, making agriculture the most sure way to wealth and the most laudable of all pursuits, and further said the state had adopted a wise policy in causing to be published for free distribution among the farmers, 13,000 volumes of about 1,000 pages, containing the cream of the work of all of the state societies, in addition to furnishing the horticultural society, dairymen's association and experimental farm a liberal quote of their own transactions bound separately.

Wednesday, Feb. 3., was an interesting day with the horticulturists; papers on our Russian fruits were read by A. G. Tuttle, H. H. Howlett and Geo. P. Pepper, and followed by an animated discussion of their merits. If we rightly understand the sentiments of the Wisconsin horticulturists on the Russians, they do not expect them to meet all of the future wants of this country, but believe the coming apple is to be a seedling of this country, perhaps of Russian parentage, or a cross with our native sorts. Considerable time was devoted to the revision of the fruit lists, discussing crab apples, how to work and grow trees, selecting of varieties as parents for seedlings, etc., in all of which we were interested but it would make our report too lengthy to more than allude to them. This day virtually closed the work of the horticultural society.

The Iowa horticultural society was represented there by two

of her most prominent members, C. G. Patten of Charles City and C. L. Watrous of Des Moines, and the Illinois Society by Professor T. G. Burrell of Champagne, and J. V. Cotte, all of them gentlemen whose acquaintance it was a pleasure to make. Thursday, the 4th, was by far the most interesting day of the agricultural convention and the audience was large and attentive. One of the pleasing features of the day was the great number of ladies in the audience and, another the intensely interesting papers by Mrs. Dr. Juliette Severence of Milwaukee; subject, Farmer's Wives. Mrs. Ida E. Tilson, West Salem, Home Adornment, and the Education of our Girls, by Mrs. Vie H. Campbell, Evansville.

The exhibition of fruits although hardly up to other years was very fine and numbered about 553 plates, among them about sixty varieties of apples, twenty-two of grapes, three of pears and a collection of cranberries, in six or seven very distinct varieties, by S. and A. C. Mills, of Madison, several of these were cultivated and have been greatly improved through a careful selection of plants for setting, and we understand that a part of them were seedlings; for size and beauty they excelled anything of the kind we had before seen, and shows plainly that this hardy and valuable fruit responds liberally to cultivation and should engage more of our attention than it has heretofore received. The Messrs. Mills have promised to give us a paper and make an exhibit at our next winter meeting. The varieties of apples upon exhibition showed very plainly that there are sections in Wisconsin where the trees did not suffer as severely in the last winter as in Minnesota. There were among them several new seedlings of extra quality and good appearance, but from what we were able to learn of their parentage, we can hardly expect that any of them will be of value to us, yet they encourage us in the belief that the originating of new varieties by selection of seed is a move in the right direction. We were disappointed in not finding a collection of new Russians in the exhibit.

In conclusion we will say that we believe these annual conventions of the Wisconsin farmers are placing the Wisconsin agricultural society into a position far in advance of ours. We may and we intend to beat them in the management of our State fairs, but they are beating us in the dissemination of knowledge among the people, and encouraging a sentiment favoring better homes, better farms and better educated men and women to manage them. We regret that our farmers cannot enjoy the benefits of such conventions, and that our

legislature has not been educated to that point where they could realize something of the benefits that would flow to our people by granting a little encouragement in the way of state aid to farmers' institutions and agricultural conventions. Our thanks are due to the officers and members of the Wisconsin society for the cordial welcome extended us, and the hospitality and kindly attentions that made our visit in Madison both pleasant and profitable, and to our own Minnesota Society for honoring us as her delegates upon this occasion. We hope that we have received benefits that shall enable us to become more useful members, and that we have formed valuable acquaintances who will lend us their aid in developing the fruit resources of the great northwest.

Again we thank the officers and members of the Minnesota State Horticultural Society for the honor conferred upon us, and the privilege afforded us of meeting upon their own stamping ground, those old veterans of Wisconsin horticulture, Smith, Peffer, Tuttle, Kellogg, Plumb and a score of others, and last, but not least, Hatch the "young America" of the society.

TRUMAN M. SMITH,
J. S. HARRIS,
Delegates.

St. Paul, Minn., February, 1886.

LOCAL SOCIETIES.

The following reports from local horticultural societies are herewith presented:

GERMAN AGRICULTURAL AND HORTICULTURAL SOCIETY OF RAMSEY COUNTY.

S. D. Hillman, Secretary etc.:

At your request I will send you a list of the officers of the Ramsey County German Agricultural and Horticultural Society, as follows, to-wit:

President—Adam Bohland.

Vice President—Alex. Knuze.

Secretary—Louis Edlefsen.

Financial Secretary—Ernest Veuzke.

Treasurer—Aug. Giesmann.

Executive Committee—Charles Bunde, Wm. Muller and John Lorenz.

The society has about fifty members, meets on the third Saturday in each month at Turner hall, St. Paul, where papers on various subjects pertaining to agriculture and horticulture, are read and discussed.

Yours very truly,

ADAM BOHLAND.

LAKESIDE HORTICULTURAL SOCIETY.

ORGANIZATION AND PROCEEDINGS.

March 25.—Secretary's minutes of organization and subsequent proceedings of the Lakeside Horticultural Society, with headquarters at Brown's Valley, Minnesota.

First meeting was called to order by J. O. Barrett.

On motion, J. O. Barrett was elected temporary chairman and A. S. Crossfield, secretary.

Upon motion of D. L. Roach, seconded by J. G. Todd, and carried, the chairman was authorized to appoint a committee of three, of whom the chairman should be chairman, to draft a constitution for the society, and who should report at next meeting.

Pursuant thereto the chairman appointed J. S. Harris, H. C. Bartlett and J. G. Todd.

Upon motion the meeting then adjourned to meet at three o'clock on the 26th of March, 1886.

March 26.—Pursuant to adjournment, the meeting was called to order at 3 p. m., by the chairman.

The first business was the report of the committee on constitution.

The president and ex-officio chairman of committee reported, and the constitution was then circulated for signature among the people present and twenty-six names were subscribed, as members of the society.

The members thus appearing then went into regular session and on motion of E. F. Crawford, seconded by H. L. Mills, the meeting authorized the chairman to appoint a committee of three who should report to the meeting as soon as possible the names of persons who should act as president, vice president, secretary and treasurer of the society until the next election of officers.

Pursuant to such authority the chairman appointed to act as such committee, E. F. Crawford, H. L. Mills and J. Robinson.

The committee reported as follows, viz.:

President—J. O. Barrett.

Vice President—D. L. Roach.

Secretary—A. S. Crossfield.

Treasurer—Jos. Branch.

On motion, the temporary secretary was authorized to cast the unanimous ballot of the meeting for these persons as officers of the society. The ballot was so cast.

The society then went into regular session with all the officers and many others present.

On motion, the president was authorized to appoint a committee of three, of which the president should be chairman, to draw up and present at the next meeting certain rules and regulations to be adopted as by-laws of the society.

The president then stated more fully the object of the society, and was followed by J. S. Harris, of the State Horticultural Society, who gave a very instructive talk on the subjects of forestry and horticulture. His long experience in the rigorous climate of Minnesota gave his remarks great weight, and aroused a good feeling and friendly discussion which was participated in by many present, to the benefit of all.

Moved by H. L. Mills, seconded by J. G. Todd, that the name of this society be the Inter-Lake Horticultural Society. Amendment was offered by A. S. Crossfield that the word Inter-Lake be stricken out and Lakeside substituted. E. F. Crawford offered an amendment substituting Brown's Valley, but upon being shown that this name appeared exclusive, it was withdrawn. The amendment was accepted and the motion given to the meeting and carried.

On motion of E. F. Crawford, the meeting was then adjourned to meet at 2 o'clock on the 27th of March, 1886.

March 27.—Pursuant to adjournment, the society met and was called to order by the president, all of the officers present.

The society then resolved itself into a committee of the whole for the discussion of ways and means, and as a result of such discussion it was decided that upon Arbor day this society should make a great effort to set out trees about all the public buildings, and along the streets of the village, in its territory.

Mr. Campfield spoke of the great benefit to schools. A. S. Crossfield thought the children likely to destroy the trees. J. G. Todd suggested the remedy, by suggesting that the children assist in setting out the trees and so have an interest in them. This solved the diffi-

culty in a moment. A. S. Crossfield made a motion, seconded by J. G. Todd, and carried by acclamation, that every school child in this section of the country who would send his or her name to the secretary would become an honorary member of the society, and that a committee of one be appointed by the president in each school district now represented in this society or which might hereafter be represented, which committee should endeavor to obtain the co-operation of the teachers in each district and appoint assistants to decorate the school grounds by setting out trees thereon on Arbor Day.

Committees were appointed as follows in this county:

District No. 6, David Burton; No. 4, Geo. Christian; No. 35, James Layden; No. 5, A. Paul, Sr.; No. 3, Geo. M. McLain; No. 2, D. L. Roach; No. 22, A. S. Crossfield; No. 7, C. C. Mills.

In Big Stone county: District No. 15, J. Robinson; district of Beardsley, Jos. Branch.

On motion it was then unanimously voted that an executive committee of five, of which the president should be chairman, should be appointed, which should confer with the local committees and have power to call meetings by publication of notice.

After further discussion by Dr. Marshall, Messrs. Todd, Campfield, Christian, Burton and others, motion was made by W. K. Weaver, seconded by J. G. Todd, and carried, that the secretary be ordered to furnish a copy of the minutes of this society to the press.

Upon motion the meeting then adjourned until called to meet by the executive committee.

A. S. CROSSFIELD, Secretary.

MCLEOD COUNTY HORTICULTURAL SOCIETY.

GLENCOE, MINN., June 7, 1886.

S. D. Hillman, Secretary, etc.,

Inclosed find clipping from the Glencoe Register of March 4th, containing an account of our first meeting, which was held Saturday, Feb. 27, 1886. We organized with eleven members, and now number twenty-five. Have held three meetings since we organized. Find it a little hard to get the members together, but intend to make it so interesting that they cannot stay away from a single meeting. Would like to send a fuller report, but am too busy at present.

Yours Respectfully,

H. J. CORSON, Secretary.

In reporting the proceedings of the first meeting above referred to the Glencoe Register, says:

The first regular meeting of the McLeod county horticultural society was held at the court house hall last Saturday. The society organized by electing the following list of officers:

President—Milon Cutler, Sumter.

Vice President—Wm. Getchell, Glencoe.

Secretary—H. I. Corson, Glencoe.

Treasurer—J. Nobles, Glencoe.

Executive Committee—Carl Hagan, Sumter; Dr. Benjamin, Hutchinson, and Jacob Koons of Penn.

Mr. Pearce of Minneapolis, addressed the meeting upon the subject of the best varieties and the best methods of cultivating small fruits, such as strawberries, raspberries and blackberries, giving his own experience in handling the different varieties. There was but a small number of the farmers present, not over twenty, as it was a bad day, but all those who were present expressed themselves as having been richly paid for their time and trouble in getting there. We predict that the horticultural society will become a useful, as well as creditable institution. The president gave each of the members present a copy of the annual report of the State Horticultural Society. After adopting a constitution and by-laws for the government of the society, it adjourned to meet at Armory hall on the last Tuesday in March.

MINNESOTA VALLEY HORTICULTURAL SOCIETY.

GRANITE FALLS, MINN., March 1, 1886.

S. D. Hillman, Secretary, etc.

Books received all right, just in season for our meeting. Please accept the thanks of Minnesota Valley horticultural society, for the same.

Our adjourned meeting occurred to-day and was a grand success. We try to make the social element an enjoyable feature of our meetings. We had a basket dinner in the hall which was enjoyed by all.

The subjects discussed were as follows: Spring Care of Small Fruit Plants, Planting of Fruit Trees, Ornamentation of School Grounds, Streets and Highways, followed by a miscellaneous conference on general horticultural topics.

The discussions were lively and interesting. Following the discussion of Ornamentation a resolution was passed that each member

plant or cause to be planted one or more trees on the highway or some other public place, and report such action at the next meeting of the society. In addition to this action a committee was appointed in each town where we have a membership to bring this matter before the town meetings and thus secure united action of all citizens in the matter so far as possible.

We are to have a record of all trees planted this year by our members and this reported to the society at the next meeting—this to embrace fruit, forest and ornamental trees.

We are getting in good working order and are securing new members right along. We hope to be able to report some good work by this society at the next annual meeting of the State Society.

Yours truly,

O. E. SAUNDERS,
President.

CORRESPONDENCE.

KIEW, RUSSIA, Dec. 28, 1885.

S. D. Hillman, Secretary, etc.

Having read in the transactions of the American horticultural society that your Society has received several medals for grapes, at the New Orleans World's Exposition, and knowing Minnesota as a State with severe winters—like our Russian—I take the liberty to ask you to have the kindness to inform me of the manner of cultivating the grapes in Minnesota, and to name me papers containing information about this interesting subject.

Be so good as to name me also the apples, pears and other fruits of American extraction that grow in Minnesota, and which in your opinion would be worthy to be propagated in Russia.

If you want some information, or seeds, or plants from Russia, please to write me and I shall make my best endeavor to serve you.

Yours with great respect,

G. DOPPELMAIR.

On replying to the above the following was received:

ST. PETERSBURG, RUSSIA, Feb. 28, 1886.

S. D. Hillman, Secretary, etc.

Much obliged for your favor of the 14th of February, and the valuable information that you have had the kindness to give me about the growing of grapes in Minnesota, the growers of Russian apples, etc.

With Mr. Tuttle I am already in correspondence and Mr. Sias' name as a nurseryman is known to me from Mr. Gibb's work upon Russian apples, and the transactions of American horticultural convention that Mr. Rogers was so friendly to send me. I have read the program of your winter meeting and the papers to be read. Your transactions or reports must be very interesting and instructive and I will be very thankful to you if you will send me copies.

I have taken the liberty to mail you some seeds of cabbages, cucumbers, rutabagoes and onions that grow in open air in Petersburg 60° N. L., and some watermelon seed that must be sown under glass and transplanted with earth; they grow with us under 45-50° N. L., in the open air.

If you wish some other seeds please write and I will be happy to furnish you with them.

With great respect, yours,

G. DOPPELMAIR.

The seeds referred to were received by the Secretary March 30th and sent to Prof. Porter at the Experimental Farm, to be tested there.

Among the list of seeds are two varieties from the Crimea, one of Turkish origin and one from Astrekan.

Subsequently the following was received:

KIEW, RUSSIA, May 17, 1886.

S. D. Hillman, Secretary, etc.

Returned after an absence of some months to Kiew. I have found your highly esteemed letters and the copy of your annual report. For these favors, please receive my cordial thanks. I will send to Prof. Porter, cions of our apples, next fall, for your experimental farm.

Please give me some indications about your climate to be of assistance to me possibly in selecting cions, from varieties grown under similar conditions and regions of your own. If I am rightly informed you have cold winters and dry summers and with great changes of temperature in twenty-four hours. I think our country has somewhat similar conditions.

Would Prof. Porter be pleased to receive original seeds of *Pirus Malus bassota* or *P. M. frunifolio*? I can send him some.

With great respect, yours,

G. DOPPELMAIR.

FROM ESMOND, DAKOTA.

F. G. Dewey, of Esmond, in renewing his membership for 1886 writes:

Our section where we are located was only settled three years ago, although a few settlers were here north of us four years ago and it has been settled there five to seven years; therefore our knowledge of horticulture is limited, as we have been in the business only three years. Apple trees being very young here have produced hardly any fruit in this section. Crabs and the varieties known as "iron-clads" are doing fairly well. Plums and cherries are quite unknown. Gooseberries, currants and strawberries are doing splendidly here and will grow fair crops; also Turner raspberry and Gregg (where covered); grapes and Snyder blackberry has been nearly a failure here.

FROM BURLEIGH COUNTY, DAKOTA.

Emil J. Claussen of Bismarck, under date of May 29, 1886, writes:

The percentage of growing fruit trees is less each year, but I am not discouraged as yet. From all indications we need hardier roots to graft on than we have had so far, for this latitude and longitude. The extremes and peculiarities of this climate are beyond belief to one not a resident. I have a grafted Russian plum which has set a few plums this spring, no apple blossoms as yet; small fruit does well with proper care.

We clip the following from the Minneapolis Weekly *Tribune*, under date of Dec. 10, 1885, from the pen of Mr. Gideon of Excelsior:

FRUIT OUTLOOK FOR THE NORTHWEST.

By PETER M. GIDEON, Excelsior.

Perhaps a few items on the apple question would be of interest to some of your readers, seeing the extent of last winter's ruin is now fully developed.

In traveling through Wisconsin, Iowa and southern Minnesota, it was sickening to behold the ruin of orchards, and but few live trees that showed health. In all my journeying the best, and I might say the only good show of live trees, was at C. G. Patten's, Charles City, Iowa. With great care he has been growing new seedlings, and with grand success. Trees strong in growth and as perfect in health as if they had never seen a winter, and with death or dying of old ironclads

all around them. His grounds teem with Russians; only three or four varieties showed health, and not half so large of same age as the new seedlings, and but few samples of fruit on any of the Russians, whilst the seedlings bore so profusely that some of them had to be propped up. Central Iowa and the whole northwest owe him a debt of thanks and they should not be slow to bestow the adequate reward. Certainly he is worthy of patronage; he has a fine stock of trees, and is a fair and honorable dealer.

We, too, have a fine showing of new seedlings that went through the last winter, and gave a fair crop the fall just past. So fine that I was awarded a silver medal for my exhibition at the American Pomological meeting at Grand Rapids, Michigan, in September.

Surely the ruin is a damper on orchardists, but they should not have in mind that fact, that the old ironclads had to succumb. We have other new ones that withstood the wreck—the hardest winter ever known in America, and the like may not occur again in the next 100 years, if ever. And even an approach to the last winter is not likely to occur inside of ten or fourteen years, which gives the planter that sets immediately an almost certain assurance of a rich harvest of many years of fruit, whether he sets the old iron-clads (the Wealthy and Duchess) or the more hardy new ones. Any of which will give a larger profit per acre in ten years—count from day of planting—than any farm crop that can be grown.

It is folly for anyone to yield up such luxuries at one rebuff, the like of which never occurred before and not likely to again very soon. I consider the Wealthy and Duchess safe to plant and too good to cast aside, though we have others of equal worth and hardier of later origin.

And now that we have a good collection that withstood the last winter with but little damage, and in season from Aug. 1 till March, and that collection yearly growing larger, none need despair of the future apple crop in the northwest. The ruin of trees is not confined to the northwest alone, but in a wide belt and stretching southeast to Columbus, O., and how much further I am not informed. Yet no one in Ohio, Indiana or Illinois doubts his ability to grow fruit there, and will reset and grow with profit the same varieties that were just killed out, and with our more hardy varieties our chances are full better than theirs.

But some may query as to why the last winter was harder on trees than other winters of as great extremes of cold? Our theory is, that a

warm current of air came from the southwest late in the fall that started the sap so that trees in warm soils and situations were in bloom—ours were just opening their bloom buds when winter set in, consequently any tree that could not stand to be hard froze in full sap flow, had to die. On cold stiff clay soil trees suffered least. And in further proof of our theory of dead trees, is the fact that throughout Michigan and on northeast exposure trees came through all right, whilst the same varieties were killed in states further south, where the extreme of cold is not so great. Therefore, I say to one and all, take courage, reset and go ahead, the ordeal is past.

PRUNING OF THE GRAPE.

By JESSE B. ROGERS, Milburn, New Jersey.

The following extracts are from a lecture by Mr. Rogers, Milburn, N. J., given at the request of grape raisers and fruit growers in attendance upon the second annual fair of the Hennepin County Horticultural Society, at Market Hall, Minneapolis, on the evening of the 23rd of September, 1885, reported by the Secretary.

Brother Horticulturists of Minnesota:

When, on the 14th day of September, 1883, the committee on native fruits in awarding the Wilder silver medal, reported to the American Pomological Society, then in session in Philadelphia, in these words: "We award the Wilder silver medal to the Minnesota State Horticultural Society for an exhibition of apples and grapes," Minnesota took her place among the states of this Union as a recognized horticultural power. Many of the delegates of your sister states for the first time had their attention called to Minnesota as a horticultural state. I was among that number, and I resolved for one to visit the spot whereon those grapes were grown. That I have done, and I have seen the place which Minnesota should always hold sacred in her horticultural annals.

This evening I intended to say something concerning the pruning of the grape vine.

* * You take a pair of iron shears in your hand and go into your vineyard. Unless the mind and the eye control the muscles of your hand you might just as well send a steam engine or a mowing machine among your vines to perform your work. My first point will be that you must educate your mind. The first great requisite is to perform more than one half of your labor in pruning the grape at your desk

or table by informing yourselves concerning the scientific culture of the grape vine; when you do that, books become secondary, mind primary.

When at Minnetonka, the other day, the complaint was universal: "We can't get fruit eyes, especially in the Concords." You all know the small terminal bud which puts forth in spring; every eye or bud of the grape is of the nature of that terminal bud. The spaces between buds are called internodes; the spot where the bud appears is called a node. A small protuberance appears, with a sharp end; that, if you will watch it for awhile, will give you the form of the wood-bud of the grape. So long as a rapid growth continues, no formation takes place except that of the wood-bud. If a too long growth is permitted, so many buds form, that nature is unable to modify or change by storing up the nutriment in the plant, or in that bud, to make it a fruited bud; so that, upon young vines, growers do not see fruit eyes when they are six or seven feet above ground; and why? Because of the rapid growth.

Buds of the grape may be divided into three classes: the wood-bud, the forcing fruit-bud, and the fruit-bud proper. Once know the distinction between these, and the pruning of the grape becomes a matter merely of the counting of the fruit-buds which you wish to have remain upon the plant.

Now, how is this change effected in practical grape growing? A bud appears at the node; that bud pushes; another bud appears in the axle of the leaf. A slight protuberance forms there, a leaf follows, and a wood-bud forms right in its stalk at the axle of the cane; that is where the bud forms which is always a wood-bud. If you allow nature to assume its sway, thousands of buds will form in a year, and as nature only wishes to perpetuate its species, the fruit-bud will form at indefinite places, so that in pruning you have to follow nature. When your vine makes a sufficient growth, you can check it without forcing this bud which forms in the axle, simply forcing the bud into a lateral, and a bud forms underneath. If you pinch it too close this bud will again break, and then you have lost from a month to six weeks in the formation of your fruit-bud; continue that process the summer through, and you have no fruit-buds at all. If, however, you pinch the end and force a lateral, your bud remains. Now allow this lateral to grow and extend in length; pinch it there again, and a bud forms underneath each of these leaves, which in process of time changes by becoming larger at the base, more round and less pointed. After

awhile it forms what is known in grape culture as a forcing fruit-bud. A forcing fruit-bud is one which is unfolded by taking undue nourishment from the vine at the expense of its vitality. Protect the same bud longer, its sharp apex disappears and it becomes a full fruit-bud. Have you never noticed at the axle the large number of wood-buds lying in there? That is nothing more than nature storing up too much vitality; so that if you have too large a fruit-bud you are running to the same extreme as too small, by having in the summer, three, four, or five shoots pushing from the same bud.

It may be asked if in some cases a fruit-bud does not produce fruit? I answer, yes. There is also another bud which appears, called an "adventurous" bud, which will sometimes produce fruit, although the bud is imperceptible to the grower in the spring. An adventurous bud is one that appears in an unexpected place; for instance, on an old cane you will find a shoot pushing from a place where you do not see a bud; that is called an adventurous bud. It is produced by too severe pruning. A wood-bud may sometimes produce fruit, but it is done at too great an expense of the stored up vitality of the vine. Thus summer pruning in its first results is the control by man of the nature and place of the fruit-bud. When you once become acquainted with the form of these three buds, pruning becomes a matter under your own control. You must have an educated mind, a quick eye, and a hand that never acts unless you ask yourself, "Why do I do what I am doing?"

When you prune the first time, reduce your vine from two to three eyes. I recommend this that the root of the vine may never become your master, but that you may become its master; so it is necessary to prune from the very first. We start then, in the second season, with two or three eyes. It is better to allow the second season two canes to grow, so that if anything happens to the one you have the other to fall back upon. After careful pruning at the end of the season, the question comes, "What form am I going to allow my vine to grow in?" On that question depends all after culture. Probably for the first three or four years some difficulty may be found in the controlling of a fruit-eye. When you prune at the end of the second season, prune one cane, if you wish to and can get a fruit-eye within a reasonable distance; if it be a new variety, or if you are in haste to see what your soil will produce, you may allow two or three bunches of grapes to grow, remembering, however, that now comes the time in which you must bend all your energies to keep your fruit-eyes

where you want them. In pruning for a fruiting vine the best experience in the state of New Jersey has demonstrated that never more than twelve fruit-eyes should at any time be allowed to grow upon a fruiting vine, no matter what its age may be. You may say twelve fruiting vines is a small number; but the result of that number is an average bunch of grapes weighing three-quarters of a pound to the bunch. To-day the largest bunch of grapes which you had on exhibition weighed thirteen ounces and a half; that is nothing more than what a vine should produce with scientific culture on fully two-thirds of the bunches it produces. Last year many bunches of grapes were grown in New Jersey weighing one and three-quarter pounds. From the second year onward your maxim should be, produce the finest fruit possible and protect your fruit-eyes. That is the main-stay of the grape culturists.

The question will arise whether to fruit upon new wood or upon old canes pruned to the so-called spur system. This question is easily answered when you once understand the nature of your fruit eyes. There are three prevailing lengths of pruning. The first is represented by the Concord family. With the Concord family I think it unsafe to run an old cane to the spur system for a long period. If I were to assign a reason, it is that the old cane becomes so hard, and so fully matures its eyes as to cause nature to spend a great deal of force in the spring bursting its buds which should be used in the development of the shoot itself. It has been found, therefore, that it is best, on the Concord, to use longer spurs of new wood. So you have to leave many more eyes on your canes than you wish. It is found, as a rule, with the Delaware, that it is better on longer fruited canes, if you trim from an old cane, to leave at least six or eight eyes on every spur that you make, and then select the shoot at the proper times. There is another class of grapes, the Diana, and most of Rogers' hybrids, that do better on very long old arms. In a conversation I had with Charles Downing, he said that the best Diana he had ever seen was fruited on an old arm fifty feet long; and on the Hudson river where they raise many of the hybrids, they find that long arms always give them a larger bunch and a better grape.

We now come to summer pruning. The eye bursts, and as I have shown, it is a compound eye, a large eye and an eye by the side of it. If the primary eye bursts first, a cold spell would check the growth and the shoot by its side bursts, then comes the question of which shoot to save. As a rule, if the cold weather continues long, the bunch on the

first shoot becomes weakened and never produces as fine a bunch of grapes as the secondary eye; so that the careful cultivator waits until about the time the buds burst. A grape vine never bleeds after three leaves are formed; before that time if you break a cane it will bleed. You may ask how many leaves you shall have beyond the last bunch of grapes. My answer to that is, it is something like the formula to a patent manure—you must be your own judge; according to the vigor of your vine and the experience had with the variety you are growing. Your grapes run to compactness. This may be due to pruning too long in the summer, or by not enough organic manure in your soil to give vitality to the vine. If it is caused by the latter, the sooner the practice of dumping the manure of this city into the Mississippi river ceases, the sooner you will have finer clusters of grapes.

After you get to where you do not care to have a fruit-eye form you may remove the surplus growth there just as much as you please, because that part of the vine is nothing more than a weed to you, and you don't want to grow any more weeds than you can help.

Another important point in this country is that of earliness in the maturity of your fruit. Nature compels you to take the first requisites toward earliness, that is, pruning sooner after the fall of the leaf. The European authorities and experimental stations have proven without doubt, and it has been demonstrated also by the American grower, that the sooner you prune after the fall of the leaf the earlier your vine bursts in the spring. Hence, in a climate where you are compelled to prune early and cover your vines, if you are in a place where late frosts prevail, don't uncover your vines before you are compelled to in the spring. The nearer the surface of the ground you can put your fruit and avoid dirt, the quicker it will come to maturity in the fall.

Another thing which I see practiced here is, too late disturbance of the soil. We in Jersey find that even in our winters we cannot disturb our soil within six weeks before the ripening of the fruit, unless it is done at the expense of the fruit-bud the next winter; so that in all fruit culture it is a question when to stop cultivating. To be successful in raising the peach or grape, culture must stop sufficiently early to allow the bud to harden.

While on the experimental farm Prof. Porter called my attention to the fact that he had stopped cultivating except to just cut the weeds with a hoe around the Russian trees. I said to him, "I suppose you do that to ripen your wood?" He said, "Yes, sir, I do; and the question

we have got to solve is, how can we cultivate deeply and save our buds. I have almost arrived at the conclusion that when cultivation stops with the hoe, about the middle of June, to cultivate longer is dangerous to the bud the following winter, should we have a hard one."

You have foes to your grapes. The fact cannot be disguised that mildew and rot are among you. At least two species of rot and one of mildew I have seen. That is one of the penalties that every fruit grower has to contend with in the raising of fruit. It need not discourage you; many have contended with it before. I wish I was able to give a remedy for it; I am not. If you want to see it in its beauty and in its destructiveness, visit New Jersey.

You have a very encouraging prospect. Your prices are two to three times what ours are on the Concord, and nearly double on the Delaware. With this standing in view, let the mildew and rot deter no man from planting grape or any other fruit. Any man that is deterred from raising sufficient fruit for his own family because of the terrors he has to contend with, is a coward. The whole question of fruit culture resolves into that of the cultivator becoming complete master of his vine or tree. If you will take the poorer land and fertilize it as it is best, I think you will have the greatest success.

DISCUSSION.

Mr. Pearce inquired if he considered it best to allow fruit eyes to form on the latterals.

Mr. Rogers. Yes, and no; the whole secret is to get just as short a cane as you can, or just as long a cane with the eyes close together. If you allow ten or twelve fruit eyes to form on the latteral, you have many places to choose from; and if your cane gets very long, it is better to fruit on the latteral than on the cane.

Mr. N. H. Emmons. Allow me to inquire: Take new vines that have grown ten or twelve feet the first year, how far back would you cut them for the winter?

Mr. Rogers. Two or three eyes, sir.

Mr. Emmons. From the ground?

Mr. Rogers. From the ground. You have got to have good roots to maintain your vines. It is a mistaken idea to fruit a vine too much until it becomes established the second year; make two prunings of it; you will save time in the future if you do. I may say that in planting an extra one-year-old vine, it is as good if not better, than the two-

year-old vine from the cutting. It makes some eighteen inches of growth the first year, and as a general thing it will have better roots and in a better compass than a two-year-old.

Mr. Busse. I would like to ask: Is it best to leave one or two canes to the plant at the end of the second year? Which would produce the best and most fruit, to have one or two?

Mr. Rogers. I never allow a vine to fruit much the second year. It makes no difference provided you leave about an equality of eyes when fruiting on each cane. There may be some advantages in leaving only one cane in layering. Bear in mind never, on a bearing cane, leave surplus canes.

Mr. Emmons. How late do you recommend continuing your summer pruning in the season?

Mr. Rogers. That is a difficult question to answer. Mildew as a general thing, appears on the younger shoots; is more apt to attack them than the older shoots, and it is a question that only experience can demonstrate; no rule can be laid down. I should continue it until I was sure that I would save and form my fruit-eyes. And if I found that too much strength was going from the vine into the bunch, then it is a question whether it is not better to risk a little mildew. Experience must be the guide.

Mr. Pearce. In New Jersey do you grow from cuttings or layers? or, in other words, which is considered the best?

Mr. Rogers. We grow mostly from cuttings, unless it is some variety difficult to propagate from cuttings.

Mr. Pearce. Is there any marked difference between cuttings and those raised from a single eye in hot-houses?

Mr. Rogers. I don't think there is, provided the eye be mature and perfectly ripe; but in the new varieties grown from new wood there is a marked difference. If you have a cutting that has three or four eyes, cut off the roots below the lower eye and you have it. I am told that bone dust does you no good; but if I were going to grow grapes here, I should go into its use experimentally, and should use bones from which glue is made—from which all the ammonia has been removed and only phosphoric acid is present. As a general rule all bone dust that contains ammonia is detrimental to fruits. The nature of bone-dust is to ripen the wood early. If used in too large quantities it contracts the wood-cell so that the sap will not circulate, hastens early maturity, and the fruit will remain of a small size, mature early and drop off.

Mr. Grimes. What do you think of common wood ashes and lime as a fertilizer for grapes?

Mr. Rogers. I think you have lime enough in your soil here without anything added. Wood ashes, as a general thing, add vigor to the growth. If you want to experiment with them at all, do it very gradually and with very few, and do not use too many ashes. I once tried half a bushel to thirty vines, planted in a row, six feet apart. The peduncle became so weak it wouldn't support itself, and my grapes dropped from the vine. The vines made an extraordinary growth the first year, and the next I had a very fine crop of fruit. If you experiment with wood ashes, take a few vines and put on different quantities and notice results. If applied too heavily it will require a careful system of summer pruning, as it excites the growth too late. Its first effect is to make the crop earlier, although its latter effect is to show itself in early ripening about the second year.

Mr. Harris. You advise not to cover the vines until early winter sets in?

Mr. Rogers. That is the rule. If you cover the vine, never cover while there is any danger of the rotting of the bud by warm weather taking place, and don't let the cane become soaked with water. Never permit water to stand and ice to form around the collar of a plant, for it is almost sure to kill any vine or any fruit tree—it stops the circulation.

Mr. Roberts. Would it be advisable, in setting vines, to put bones and old leather under them, and would that be of any benefit?

Mr. Rogers. Do you mean in amateur culture or commercial?

Mr. Roberts. In either.

Mr. Rogers. In commercial practice it will be well to experiment, if it don't cost too much for labor. To make a trench, take large ones and pave the entire bottom, and on top of that put some bone-dust. That is done a great deal. One of the most successful amateurs I know of digs down two and a half feet deep, paves with bones, and on top of that puts about ten or fifteen pounds of bone-dust mixed with earth. He raises the finest grapes I know of, but the expense is too great in commercial culture.

Mr. Harris inquired if burning a vineyard would not destroy the insects, and if it would not be well to plant again at a distance of half a mile to avoid the mildew?

Mr. Rogers. I don't think a distance of half a mile would be sufficient, for experiments in New Jersey have shown [that mildew will

travel half a mile; but I do not think you should grow a vine ten years, especially the Concords, for the older the vine the later the fruit matures. It will make a difference of about ten days.

Mr. Harris. Do you know of any remedy for the blue beetle or the curculio?

Mr. Rogers. At our agricultural society meeting, Prof. Riley was present, and the question came up of getting rid of the blue beetle that burrows into your bud in spring and eats it all out. He recommended, what I had found to be true, that a Clinton, which is about the earliest vine there, be planted; the insects would collect on the Clintons, and then poison could be applied and soon the vineyard would be very nearly rid of the pests.

AMERICAN POMOLOGICAL SOCIETY.

The twentieth session of the American Pomological Society was held in the city of Grand Rapids, Michigan, Sept. 9 to 11, 1885. An excellent and concisely arranged report of the proceedings appears in the transactions of the Indiana horticultural society, prepared by Prof. J. Troop, of Purdue University, which, for lack of space for a more extended notice, is inserted here:

At the opening session Secretary Beal announced that the President, Marshall P. Wilder, of Boston, could not be present for reasons expressed in the following note:

"Gentlemen of the American Pomological Society:

"I still live, and would most gladly be with you on this occasion, but as discretion is the better part of valor, I am compelled by the advice of friends of our cause not to take the risk of so long a journey, and the consequent fatigue of our session, but to reserve my health and strength in the hope that you will come to me at Boston, in 1887, when we may consult personally again on the great interests which our society has in charge."

It may be of interest to some to know that this veteran Pomologist is now over 87 years of age.

Patrick Barry, of Rochester, N. Y., was chosen President *pro tem*.

After a few well-chosen words of welcome from Mr. Lyon, president of the Michigan horticultural society, the chairman introduced Dr. J. B. Angell, of the Michigan University, who delivered a very interesting address, in which he cordially welcomed the society to the state. In the course of his remarks he said:

"The memory of most of us easily runs back to the time when few or no cultivated strawberries were to be found anywhere in the land, and now your reports easily enumerate, I suppose, 400 or 500 varieties. Substantially the same statement can be made concerning the grape. Similar if not equal progress has been made with other fruits. I suppose the value of the fruit crop of the United States in a good year must approach \$100,000,000. And the increase in the quantity has hardly been more remarkable than the improvement in quality."

After this address the committee on credentials reported the list of delegates present, the number being unusually large, including most of the leading pomologists of America.

Next came the usual discussion as to where the next meeting should be held. J. B. Moore, of Massachusetts, offered Boston, in behalf of the Massachusetts horticultural society. He urged that the place be accepted in order that, if his life be spared, the venerable president might be in attendance. It was so decided.

The following officers were then elected for the next two years: President, Marshall P. Wilder, of Boston; First Vice-President, Patrick Barry, of Rochester, N. Y.; Treasurer, Benjamin G. Smith, of Cambridge, Mass.; Secretary, Chas. W. Garfield, of Grand Rapids, Mich. At this point a telegram was ordered sent to President Wilder, notifying him of his re-election as President of the society, to which he replied as follows: "All right; go ahead. I accept the presidency. God bless the old Pomological."

The next business of importance was the reading of the address of President Wilder, by ex-Secretary Beal. In it he says: It is thirty-seven years since the society was organized. His resignations as President has always been declined, and a special officer having been selected in his place when absent, he regarded such action as a testimonial of regard for past deeds rather than for anything he could now do. He alludes at length, and very fittingly, to the society's mission, to what it set out to do, and what it has so well accomplished. He alludes tenderly and affectionately to the death of Charles Downing, according him a high place in history. In the list of the society's accomplishments, he enumerates a higher standard of excellence in judging, education of taste, discouraging cultivation of inferior sorts, more than 600 varieties having been discarded; a uniform system of rules for judging; reform in nomenclature and many other things. He again urges "a system of nomenclature pure and plain in its diction, pertinent and proper in its application," and asks the nurserymen to aid in this reform by revising their catalogues. Speaking of improvements by

cross-fertilization, he asks for a pear "with the richness of the Seckel, form and size of the Bose, and vigor and productiveness of the Boussock." Again he urges the injunction "Plant the most mature and perfect seeds of the most hardy, vigorous and valuable varieties; as a shorter process, insuring more certain and happy results, cross and hybridize our finest kinds for still greater excellence. Go on! Go on! while you live, and when we are gone, others will rise up to chant our old song:—

Plant the best seeds of all your best fruit,
 Good fruits to raise that some lands may suit;
 Fruits which shall live their blessings to shed,
 On millions of souls when you shall be dead.

Plant! plant your best seeds—no longer doubt
 That beautiful fruits you may create;
 Fruits which, perchance, your name may enshrine,
 In emblems of life and beauty to shine."

In conclusion he adds: "Fruits are the overflow of nature's bounty, gems from the skies, which are dropped down to beautify the earth, charm the sight, gratify the taste, and minister to the enjoyment of life; and the more we realize this, the more shall we appreciate the Divine goodness to us, and the duty of providing them for others."

The subject of new fruits was then taken up, and apples being the first called, Mr. Green, of New York, asked about Yellow Transparent. Mr. P. M. Gideon, of Minnesota, said it was of Russian origin, and about as hardy as Oldenburg, although last winter proved too much for it. Several members spoke well of it as an early apple, which was two weeks earlier than the Red Astrachan. Mr. Chase wanted the Dickenson apple to go on the list starred for Pennsylvania. It was a seedling of the Yellow Bellflower, and similar to it in quality. The Shannon apple was thought by many to be especially adapted to the soil and climate of Arkansas. Mr. Lyon said it was of poor quality, but good to sell. The Cellena was said to be of Polish origin, and about as hardy as Fameuse. The Glast apple was considered by Mr. Auger, of Connecticut, as being delicious for baking and a fine fruit generally. Mr. Gibb said the Thaler was considered an early market fruit in Nova Scotia, ripening in July much like Yellow Transparent. Mr. Lyon asked about Wolf River, a seedling shown at New Orleans. Mr. Gideon said it proved tender in Minnesota. Prof. Budd thought it was 30 per cent. hardier than Fameuse. Mr. Gideon said the hardiest apples, before last winter, were the Oldenburg and Wealthy; but last winter killed these also. He said the more crab we can get into our seedlings the hardier they are. In response to an inquiry regard-

ing the Excelsior and Gideon crabs, he said that both varieties originated with him from seed of a small crab. From five hundred seedlings of Excelsior only twenty proved hardy. The Salome apple was well spoken of by several members. The Northwestern Greening was not hardy, otherwise a promising variety. Mr. Gipson, of Colorado, asked about Lon apple. Mr. Gideon, of Minnesota, replied that the Lon apple originated on his farm. It is very early and succeeds well in the south, as well as where he lives. It would drive any other apple out of the market; one of the hardiest trees and of excellent quality. The Missouri Geneting was well spoken of for the east. The Ohio Greening was said to do better in Michigan than the Rhode Island Greening. Commissioner Colman spoke of Wright's Genet, which he had been instrumental in bringing to notice. It resembles Rawle's Genet, but was a much larger tree. Prof. Budd spoke of one of the Russian apples which, he thought, should have more general notice. The name translated into English was Longfield. It was hardier than Fameuse, larger than the Jonathan, yellow, and about the size of the Missouri Geneting. Mr. Barry remarked that the Fameuse was good enough for anybody. He said: "Up in the Adirondack region they can grow nothing else. The trees are loaded." Mr. Gibb of Quebec, considered Whitney's No. 20 the best of the crab class. Mr. Gideon considered it several removes from the Siberian crab species. It had but very little crab blood in it. Early Strawberry was favorably mentioned. Mr. Woodward, of the Rural New Yorker, thought every family should have at least one tree of the genuine crab; there is nothing to compare with it in the apple line for making jellies. This closed the discussion on apples, and at the evening session the society listened to an illustrated lecture on "The Injurious Fungi in relation to the Diseases of Plants," by Prof. C. E. Bessey, of Nebraska. He stated that the only remedy for this fungus was the knife. The diseased portion must be cut off, whether it be a leaf, limb, tree, or whole orchard.

At the morning session of the second day Prof. J. C. Arthur of the New York Experiment Station read a paper on the same subject; he however confined his remarks more especially to pear blight. The paper was well received, but the audience was left in ignorance concerning the most important point, viz., a remedy for the disease. In speaking of protection from frost, Prof. Lazenby, of Ohio, said, that in his tests with mulched and bare ground, he had invariably found a difference of from 3 to 5 degrees in favor of the bare ground. The

mulch prevents the absorption of heat by day, and radiations by night. Mr. Morill, of Michigan, preferred to mulch nevertheless, because it paid in dollars and cents. Mr. L. B. Pierce, of Ohio, then read a paper on "How to conduct State and Local Horticultural Societies." The paper was so full of good sound suggestions that I may perhaps be pardoned for giving a few of them here. He said: "Exhibits of fruits, flowers and vegetables at each meeting should be encouraged, as they are valuable object lessons, fixing knowledge of varieties, and correcting erroneous ideas. State horticultural societies were representative bodies, and the social feature had to be abandoned to a great extent. In times past these organizations had devoted themselves largely to introducing and encouraging new fruits and to reports of the seasons, known as ad interim reports from officers. This work is not as necessary as formerly, owing to the large number of fruits now known and the disposition of originators to push them into notice. State societies should have the backing of the legislature with liberal appropriations and they should be aggressive in their work, pushing it by the personal work of the secretary, who should be paid sufficient salary to enable him to devote his whole time to the work. There were thousands who knew neither the delights of using or of growing the finest fruits and flowers, and these should be reached by the establishment of local societies. The work that a live state horticultural society with one or more efficient local societies in each county can do in the lines that I have briefly indicated is great, and sooner or later will have to be done." Mr. L. A. Goodman, of Missouri, gave some "Lessons from the World's Fair." Mr. Lyon, of Michigan, followed with a short paper on "Nomenclature of Fruits." The subject was ably handled and the paper full of good suggestions. Mr. Gibb, of Quebec, spoke on "Nomenclature of Russian Fruits," and said that in Minnesota the Lieby was coming into notice on account of its hardness. A resolution was adopted to the effect that before these Russian apples are placed in the society's catalogue a committee should be appointed to revise the list and the names.

A lengthy discussion followed Prof. Lazenby's paper on the "Influence of pollen on the size, form, color and flavor of fruits." Mr. Fuller, of New Jersey, favored the theory, while Mr. Williams, of the same state, as strongly opposed it. Dr. Hexamer, of New York, said: "No matter what scientific men say about these things, that it can not be, because it is against all principles of science, I consider the theory highly probable, and I know that such influences do occur."

After Mr. C. A. Green, of New York, had read his paper on "The Hardiness of Plants," the discussion of strawberries was begun by Mr. Williams of New Jersey, and Parker Earle, of Illinois, was asked the name of the best strawberries grown by him. He said: "I consider the Crescent best of all. I fail with almost all other kinds." Commissioner Colman asked, "Why is Crescent better than the Wilson?" Mr. Earle replied, "That it was because he could grow it and so get it to put into market, which he could not do with the Wilson on account of the rust; this did not effect the Crescent in the least. Then, again, the Tarnished Plant Bug prevented the successful culture of most other varieties." Mr. Morrill, of Michigan, said: "Down on the lake shore we use Crescent for early on light soil, and Sharpless for late on heavy soil." Dr. Hape, of Georgia, and Engle, of Pennsylvania, preferred the Sharpless. Blackberries came up next for discussion. Stone's Hardy was said to be hardier than the Snyder, but too small for market. Ancient Briton was very successful at Ripon, Wis. Mr. Johnston, of New York, said that as a rule the hardy blackberries are small. Mr. Green said the Evergreen blackberry was of no value. Several members reported the Early Harvest as winter-killing badly. Mr. Munson said it belonged strictly to the south, and, with Brunton as a companion, both succeeded well, producing from 5,000 to 6,000 quarts per acre. Mr. Campbell, of Ohio, said the Lucretia dewberry was as good as anything he had tasted in the way of a blackberry, but it must be entirely ripe. Mr. Scott thought that Taylor's Prolific was better in quality than the Snyder; but Mr. Lyon could see but very little difference between them. A valuable paper on blackberries by Mr. Cowing of Indiana, was read.

Raspberries came next and Caroline was asked about. Mr. Green and Mr. Rogers considered it an excellent berry but too soft for market. There was a great deal of discussion concerning the Shaffer. It was generally considered, however, to be an excellent berry for canning or cooking, but the color was against it. Mr. Morrill asked about the Nemaha. Mr. Green and Mr. Scott found it hardier and better than the Gregg. The Marlboro received much praise with regard to productiveness and earliness; the quality however, was only fair. Mr. Engle thought the Rancocas had come to stay. Dr. Hexamer said it ripened its entire crop in from eight to ten days. Mr. Hobbs said that Crimson Beauty was a strong grower, hardy, of beautiful color, better than Hansell or Marlboro, while Mr. Green never could get a perfect berry from it, after four years cultivation. At the

close of the afternoon session of the second day, Mr. Campbell, of Ohio, read a paper on "American Grapes Forty Years Ago." Said he, "Catawba, Isabelle and Clinton, were about the only varieties we had.

"Mr. Downing names only about one hundred and sixty varieties in his catalogue. In 1880 the Mississippi Valley society had two hundred and forty-nine distinct varieties on exhibition. Now, we probably have over three hundred in cultivation, and still they come. But improvement in character and quality has not kept pace with the increase in number of varieties. In quality very little advance has been made since the Delaware. We have mildew of foliage, rotting of fruit and tenderness of vine in winter. Perhaps these obstacles will be entirely overcome in the future. What is wanted is a vigorous vine that will resist attacks of mildew, endure a temperature of 40° below zero in winter, and 100° above in summer. Hardiness, healthy foliage, and good quality are now the desired points in grapes. There is a tendency to too many new varieties. Many are most unworthy, but advance has been made and still further improvements may be expected in the future."

The evening session was given up to an illustrated lecture on "Economic Entomology," by Prof. Cook, of Michigan. At the morning session of the last day, after the usual amount of routine business had been disposed of, Commissioner Colman, of Washington, addressed the society, after which came a paper on "American Grapes," by T. V. Munson, of Texas. This paper was among the ablest presented during the sessions. The subject was treated from a scientific standpoint, showing the characteristics and adaptabilities of the different species of grapes. A discussion of some of the newer grapes was then taken up. Mr. Rogers, of New Jersey, spoke of the Ironclad grape, and said that it was worthless; and Mr. Hubbard, of New York, said that it was a worthless wild fox grape, and good for nothing. Mr. Lyman, of Virginia, had grown the Wyoming red for years and pronounced it very good. Several other members spoke favorably of it. The Niagara was pronounced good, free from mildew and rot, and as hardy as the Concord.

Mr. Barry, of New York, thought the Empire State was a good variety. Mr. Campbell said it was fine flavored and remarkable for healthy foliage. Several members had grown the Ulster Prolific, and pronounced it one of the best.

Mr. Smith, of Massachusetts, spoke favorably of the Hayes, as did

Mr. Manning and Mr. Campbell. Mr. Hubbard, of New York, spoke of the Centennial as having a small berry, but large cluster and good quality. Mr. Campbell said it was not hardy. Amber Queen did well with Mr. Hubbard for awhile, but not so good now. Victoria was well spoken of for New York. The Triumph was said to be very promising in the south. Eldorado received no words of praise. "Not worthy of cultivation," was the general verdict. The Highland rots badly. Vergennes was said to be very promising; good reports concerning it were made from many states. Early Victor was praised by several members as being a strong, healthy grower, inclined to overbear; but Mr. Munson said it was not profitable in Texas on account of the rot. Jefferson was generally condemned as being too late. Mr. Woodward said: "We can get it ripe only about once in ten years." Moore's Early received only words of praise from every section of the country. Lady Washington was spoken very highly of for the south, but too late for New York. Prentiss was too tender and mildewed badly. Worden was spoken very highly of for both north and south. Prof. Budd thought it was the best black grape we have in the west. A. E. Wordon entered the room during the discussion and invited the pomologists to take a drive at 1 o'clock P. M. out to the Munson & Knapp fruit farms, located about two miles north of the city. Private citizens generously offered the use of their carriages for the purpose. A committee, composed of Mr. Munson, of Texas; Auger, of Connecticut, and Uber, of Virginia, was appointed to compare the Worden and Concord grapes for the purpose of determining which is best in regard to time of ripening, size, etc. Continuing the discussion, Mr. Green thought the Duchess was one of the finest grapes of recent introduction, to which several members replied, "Yes, when we can get it." The Pocklington was said to be a strong grower, but subject to rot. Woodruff Red was a good market grape, but quality rather poor. The Eaton grape was mentioned by Mr. Manning as having a large, showy bunch, and quality good.

At the last afternoon session papers were read as follows: W. I. Chamberlain of Ohio on "Needs and methods of gathering fruit statistics;" "Packing and Shipping," by Parker Earle, of Illinois; "Fruits of the Northwest," by Peter M. Gideon, of Minnesota; "Insects Injurious to Fruits, and Remedies," by Prof. Lazenby, of Ohio; "Hard Problems in Pomology," by Prof. Budd, of Iowa. Among other things he said, "I am in favor of establishing experiment stations in every state and in various parts of each state in which new

fruits shall be tested under the charge of the state societies." Mr. Auger heartily endorsed this plan, and offered a resolution to the effect that each state society or board of agriculture be urged to employ a certain number of experts to try all new fruits that shall be submitted to them for growth and test, whose duty it shall be to report the result in each case. The resolution was adopted. The last paper was by Mr. E. T. Field, of New Jersey, on "The Cocoanut, its uses, and how and where to grow it." The committee sent to the Munson & Knapp farm to compare the Worden and Concord grapes reported. The Worden was considered the better, taking all things into consideration. The collection of fruit was large and very fine. The committee reported nearly 2,200 plates on exhibition, of which Michigan furnished 1,000; Ohio 114; Missouri 211; Ellwanger & Barry, of Rochester, N. Y., 140; Benj. G. Smith, Cambridge, Mass. 61; Henry M. Engle & Son of Marietta, Pa. 61; and Prof. L. H. Bailey, jr., Lansing, Mich., 75, besides several other smaller lots. The committee awarded the Wilder gold medal to Marshall P. Wilder for his collection of 100 varieties of pears.

The last evening session consisted of short speeches from about twenty of the most prominent members, after which the society adjourned to meet in Boston in 1887.

HORTICULTURAL LEGISLATION.

Chas. W. Garfield, the efficient secretary of the Michigan state horticultural society for many years past, has compiled some interesting facts relative to the legislation of the different states and provinces, from which we take the following extracts. In his introductory he says:

"In performing the duties which have devolved upon me since my first election to the office of secretary of the Michigan horticultural society, and in shaping the policy of the society, I have often questioned what other societies have done under similar conditions. In seeking the information desired, I have always found the secretaries of sister societies ready to render any assistance in their power, and oftentimes at a personal sacrifice they have furnished the data sought. It occurred to me during the last year that inasmuch as the matter of securing special legislation in the interests of horticulture and forestry was occupying the attention of societies and individuals in various states about us to a considerable extent, it might be profitable to in-

quire just what attention had been given by the law-makers of the land to questions that effect these interests."

With regard to legislation in California the report shows that an act was passed in 1880, entitled "An act for the promotion of the viticultural industries of the state," in which the governor is authorized to appoint a board of nine commissioners, who are required "to meet semi-annually and to consult and to adopt such measures as may best promote the progress of the viticultural industries of the state." The sum of \$10,000 a year for ten years was placed at the disposal of the board, whose duty it is made to look after the grape interests of the state in the greatest detail; especially with regard to the matter of diseases and insect pests. The law gives them power under certain restrictions, to seize upon and destroy infected vines that might cause contagion, imposes fines for transporting diseased vines or fruit, etc. In 1883 a state board of horticulture was created, providing for an inspector of fruit pests, and the sum of \$5,000 per year was provided to carry out the provisions of the act.

In 1885 the legislature of California passed an act in the interests of horticulture which provides, among other things, that:

"It shall be the duty of every owner, possessor or occupier of an orchard, nursery or land where fruit trees are grown within this state, to disinfect all fruit trees grown on such land infested with any insect or insects, or the germs thereof, or infested by any contagious disease known to be injurious to fruit or fruit trees, before the removal of the same from such premises for sale, gift, distribution or transportation. It shall be the duty of the owner, lessee or occupier of any orchard within the State, to gather all fruit infested by the insects known as the codling moth, peach moth, red spider, plum weevil, and kindred noxious insects, their larvæ or pupæ, which has fallen from the tree or trees, as often as once a week and dispose of or destroy the same in such a manner as to effectually destroy all such insects, their larvæ or pupæ."

It is further provided that:

"All fruit trees infested by any insect or insects their germs, larvæ or pupæ, or infected by disease known to be injurious to fruit or fruit trees, and liable to spread contagion, must be cleaned or disinfected before the first day of April, 1885, and on or before the the first day of April of every succeeding year thereafter."

Secretary Webb, in commenting upon the legislation referred to, says:

"My opinion is that all laws for the protection of the orchardist against the ravages of insects should be plain and simple in construction, and reasonable and not unnecessarily harsh in their application. The first and indispensable consideration, is a liberal appropriation of money by the state, and the creating of a board of commissioners—their actual traveling and incidental expenses to be borne by the state. This board shall be selected on account of their superior knowledge and experience in horticulture, and the appointing power in the selection of its members should by all means ignore party politics. The duties of the secretary of a useful and efficient board of horticulture such as every fruit growing state should have, will be so large and extensive as to require not a mere clerk but a first class man, and his compensation should be sufficient to pay him well for his time. The same as regards the office of the chief horticultural officer, who should devote his entire time and attention to the duties of his office, chiefly in the fields, giving instruction in the mode and manner of planting, pruning, cultivation, etc. In our state the secretary receives \$150.00 per month and the latter officer \$200.00 and all his traveling expenses are paid by the state. The last appropriation by our legislature was ten thousand dollars per year for the state board of horticulture; fifteen thousand dollars per year for the state board of viticulture; also viticultural, experimental, scientific and analytical work, including apparatus and suitable accommodations for the same, under joint control of the board of regents and the state university and the board of state viticultural commissioners, five thousand dollars per year. I have not a doubt but for every dollar our state has expended in aid of these interests there has been returned in an increase of taxable property, more than it would have been without such appropriations, more than twenty dollars for every one expended by the state.

Secretary Clark of the Colorado state horticultural society, after referring briefly to legislation in that state, says:

In my opinion the subject of fruit culture and tree culture should receive from our legislature special attention. Our supply of natural timber, never very large and limited in variety, will soon be exhausted and unless replaced by artificial growth, a heavy drain will eventually be made on the finances of the people to supply timber for mechanical uses. The question of the influence of forest trees on the water supply for irrigation comes in here, and is one of vast importance. The influence of forests on the evaporation and precipitation of moisture is not as generally understood as it should be, and facts bearing on this whole

subject should be brought before our law makers. Fruit culture calls for a more intelligent recognition by our legislatures. A liberal policy in this direction would hasten, by many years, the development of the fruit-growing interest, and save to the people of the state millions of dollars which will be sent abroad for fruits which can be raised here. Colorado possesses a greater variety of soil and climate than any other state in the union, and her possibilities are not yet understood even by our most intelligent people. Hence more light is what we need to show our law makers the direction in which they can best promote the interests of the people.

In Georgia a state horticultural society was organized as early as 1858, which is still in existence with a large membership and governed by a code of rules which have resulted in giving the greatest impetus to fruit culture. It is stated that "Its annual sessions and exhibitions are increasing in usefulness, and it is conceded that in no state has such a variety of pomological products ever been brought together."

In Illinois the state horticultural society was incorporated in 1857, and reorganized by an enactment in 1874.

It was largely through the influence of the leading spirits in this society that the state provided for a state entomologist, and by liberal appropriations secured the services of Walsh, LeBaron, Thomas, and Forbes, specialists, who have added so largely to the general information concerning the habits of injurious insects and means for their destruction. No state has done more efficient work for horticulture than Illinois in supporting the work in this field. The society took the initiative step which finally resulted in the establishment by the state of the industrial university, from which institution the horticulture of Illinois has received efficient aid.

The society in that state has a regular apportionment of \$2,000 per annum. The horticulturists of the state are awake to their interests and are moving for a fully equipped and carefully managed experimental station.

In Indiana a state society was incorporated under a general act of the assembly in 1875 and a place provided at the capitol for a museum and library. The annual appropriation is about \$400.

The Iowa legislature in 1872 passed a law with reference to the work of the state horticultural society, making it the duty of the society to encourage the formation of local societies in the interests of fruit-growing and tree planting; providing for an annual report of the secretary to be made to the governor; arranging for the publication

of the transactions of the society by the state; and their distribution by the state and the society, and providing an annual appropriation of \$1,000. Previous to 1879 there were printed 3,000 of the reports of the state horticultural society. Since that date an additional two thousand has been authorized. Later on, there is an enactment which compels school districts to set out and protect not less than twelve trees on the grounds about the school building, and directs the county superintendent of schools to see that the law is enforced. The legislature with perfect unanimity, gave the society a museum and an office large and convenient apartments on the main floor of the building, with a store room directly beneath in the basement, of sufficient size to accommodate quite large meetings of the society.

In Kansas a state horticultural society was organized in 1867 with twenty-five members, which has steadily increased in members and influence until the present time, when it has about 175 annual members.

Secretary Brackett writes:

"The law passed at the session of the last legislature was quite liberal as it appropriated a sufficient sum of money to cover the expenses of publishing an edition of eight thousand copies of our annual report, and six thousand copies of a forestry manual for each of the next two years. The policy of our state legislatures since 1873 has been to encourage a rapid and extensive development of the horticultural resources of the State by disseminating among the people a most thoroughly practical knowledge of successful methods of culture and of varieties of fruit adapted to our climate and soil, as a heavy immigration has been attracted to and induced to settle by the displays of products in eastern states—a class of lovers of fine fruit, but which was ignorant of the peculiarities existing in this state. The results have been gratifying. We have at this date over 20,000,000 forest trees, under successful culture, and about 150,000 acres of artificially planted forest trees, and the work of extension is heavier than at any previous date. This can be truthfully said to be the fruit of wise and intelligent legislation."

Secretary Boardman of the Maine state pomological society reports that "the \$500 appropriated annually is spent to the best advantage in encouraging pomology and horticulture. Our state assumes the expense of publishing our reports, which in some past years have contained matter of great value to our orchardists."

The Massachusetts horticultural society, organized in 1829, the

wealthiest organization of the kind in the world, has never received any aid through state legislation. Its annual gratuities in the way of premiums have been large, and its influence upon the progress of horticulture in this country has been greater than that of any other society. The Massachusetts board of agriculture, organized under state law and well supported by annual appropriations, has given horticultural matters their full share of attention. The state gives a bounty not to exceed \$600 per annum, to societies in the interests of agriculture. The following enactment exempting property, of societies organized in the interests of horticulture from taxation, was passed in 1884: Such portions of real estate and public buildings belonging to incorporated horticultural societies as are used for their offices, libraries and exhibitions, shall be exempt from taxation.

In Michigan a liberal provision is made for the printing and distribution of the annual reports of the state horticultural society. The following is the text of the section under which the reports are printed and distributed: The secretary of the state horticultural society shall make a report annually, similar in character to that of the secretary of the state board of agriculture, but covering the subject of horticulture; eight thousand four hundred copies of said report to be printed and bound in like manner as the report of the secretary of the state board of agriculture. Six thousand copies shall be placed at the disposal of the state horticultural society, which shall be distributed in like manner as the report of the secretary of the state board of agriculture, giving preference to horticultural and pomological societies and fruit growers, wherever such may exist within the state, and the remaining copies shall be disposed of in the same manner as the joint documents.

MINNESOTA.

In 1877 the legislature provided a penalty for trespassing by hunters with dogs. There was also a law enacted for punishing those who willfully entered upon premises and injured trees or growing crops.

In 1873 the legislature provided for the printing of a limited number of the transactions of the state horticultural society annually and in 1881 the law was amended so as to appropriate a sum not exceeding \$750 annually for the publication of the state horticultural report, and \$1,000 for incidental expenses of the state horticultural society. Under the provisions of this act 5,000 copies of the report of the society were authorized, 1,000 of which number were to be

bound in cloth to be used in making the customary exchanges, supplying one copy to every library and scientific institution, and the balance to the society. In 1883 the law was so amended as to provide for the publication of 3,500 copies of transactions, limiting the size to 500 pages. In 1878 the legislature made an appropriation of \$2,000 for the purchase of an experimental fruit farm, also provided \$1,000 for Mr. Peter M. Gideon to use in developing and managing it. This appropriation is still continued. In 1881 the timber act was passed, which gave a bounty of three dollars per acre for six years to persons who would plant and maintain in thrifty condition 2,700 trees per acre, of any timber variety except black locust. The enactment also provides for a bounty of two dollars per year for each half mile of highway trees planted and maintained in thrifty condition for six years, the trees to be eight feet apart; cuttings and seed planting allowed under the act, but in such cases the first year is not counted. In 1883 there was an appropriation of \$5,000 to be employed in forest planting, editing and distributing literature in the interests of forestry, protection of forests, etc.

In Missouri the reports of the state horticultural society (organized in 1859) were printed by the state after 1863. The report, until recently, was issued as a part of the report of the state board of agriculture. Since 1879 the horticultural report has been issued as a separate document. For some years the state horticultural society has received an annual appropriation of \$1,250.

In Nebraska in 1873 the legislature voted an annual appropriation of \$1,000 in aid of the work of the state horticultural society, and its reports have been published at the expense of the state. For the year previous, the appropriation was \$2,000.

In New York liberal appropriations have been made from time to time in the interest of horticulture. The organization of an agricultural experiment station and the annual outlay of \$20,000 is largely in the interests of horticulture. The experiments heretofore conducted have already proven of great value.

The Ohio state pomological society, organized in 1847, was reorganized as the state horticultural in 1867, and by legislative enactment the proceedings were published by the state in the volume issued by the board of agriculture. An appropriation of \$300 per year was made by the same legislature for the use of the society in the prosecution of its work; and two years thereafter it was raised to \$500 per annum, and again in 1883 raised to \$1,000. The publication of the state horticultural reports with the volume of the board of agriculture

gives a wide distribution to the transactions of the horticultural society at no expense to that organization.

The transactions of the Pennsylvania fruit growers' association are published by the state in its volumes of agriculture.

In Vermont a state board of agriculture was established in 1871 with an annual appropriation of \$3,500. Among the duties prescribed in the act of establishment, is that the board shall investigate horticultural matters and make recommendations concerning the art.

In Wisconsin a law was enacted for the encouragement of the planting of timber belts, providing for a bounty of two dollars per acre, upon the certificate of the assessor. Also an act for the regulation of the sale of cranberries.

The state horticultural society was incorporated in 1871. The following year 2,000 copies of its reports were printed, \$150 being allowed for illustrations. In 1878 the number of volumes was increased to 3,000, with an appropriation of \$500 for the general purposes of the society.

In 1879 the society was reorganized, made a state institution and the secretary required to report to the governor. The reports were limited to 350 pages and to 3,500 copies. In 1883 the number of volumes in separate binding was limited to 500, while 11,500 were bound with other state reports to be distributed by the agricultural society. In 1885 a volume of 500 pages was authorized with an appropriation to the society of \$1,000 per annum for two years.

Mr. Plumb, of Milton, Wisconsin, writes:

The legislation in the interests of horticulture most needed in our state is a law establishing experimental stations; and for horticulture more than any other industry we have. Not one alone, but several located in the five or more climatical and geological districts of our state; these to be under the superintendence of the central station, but in the care of good, thorough, intelligent men or women, and all managed on a uniform plan. The advantage of such a system would be, 1st, to settle many now unsettled problems in tree and fruit growing for the state at large and for each division of the state, and much more satisfactorily than private enterprise can do it. 2nd, it would not only give direction to private enterprise but would give assurance and safety in it. No other state in the union has a greater variety of natural conditions, and therefore none so needy in this direction. Experimental stations should be in our state, adjuncts to an agricultural college,—which in time our state will have, when our farmers are educated up to their real needs in this line.

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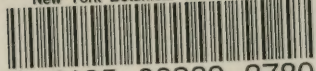
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